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M. M. S.
5/14/1900.

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THE PRESIDENT'S ADDRESS.

By David Barrow, M. D.
Lexington, Ky.

Ladies and Gentlemen: Must I apologize for choosing for my subject to-night, Recreation and Rest? True, I can not expect to present a single new thought, but hope by going over familiar ground and emphasizing known facts to accomplish a little good.

The American citizen, as you know, is active, capable of great exertion, and lives under high pressure, rarely considering his own health, and always bent upon accomplishing quickly what should require great time. The cares and worries of life are many, at best, and must cause the young to become prematurely old, the robust to become delicate, the young wife a care-worn wreck, the active business man a crabbed old fellow, unless tempered with judgment in regarding nature's laws and living as she demands. Disregard nature, be unreasonable in life, burn the candle at both ends, and care not for her warning, and surely you will be held responsible and must pay the penalty. What that penalty is no one knows better than the physician, for how often do the following pictures present: It may be the business man, who, after years of unrelenting labor, comes with the statement that he has not been absent from the store in a year; that when not at the store his business was constantly with him in thought; that he had discussed it with his wife, that he had lain awake at nights thinking about it, that he had really been successful and had made money; but says he: Doctor, I have become nervous, my appetite is poor, I sleep badly, I take but little interest in the ordinary things of life. I am irritable, cross with the children, and can not bear to have them noisy,

and am often impatient at home. That man is miserable, his money does not soothe him, those children and that wife can not make him happy. He is paying the penalty of business dissipation and excess, and has gone on unreasonably taxing nature, and has failed to take that recreation and rest so essential to the preservation of health. To restore him to health requires much time; he must rest, be free of business cares, and have something introduced into his life that will change his thoughts from the old channel. Had the danger signal been seen earlier, treatment would have been easier, cure more speedy and certain. Had nature been regarded and not abused, had that man taken the necessary recreation and rest, by occasionally hunting or fishing, or in some other way, there would have probably been no necessity of treatment, for he would have continued well. This is a picture very common and recognized by all physicians.

The next is equally familiar, and to me intensely distressing; it first shows the bright, happy, and hopeful young woman, but little pain has been her lot, her past is a sweet recollection, and the future promises only joy. In robust health, loved by mother, father, sister, and brother, her capacity for the enjoyment of life has been great.

Then the picture changes. She is the young wife, still healthy and happy, and in the future nothing but contentment is discerned. Then another change. Ten years have gone by, the mother sits with the little ones around her, perhaps; the plump and rosy cheeks are now thin and pale, she is slight in figure, nervousness marks her every movement, she is careworn, prematurely old at thirty. Ten years of constant care; the little ones were nursed through illness, small and great; day after day her life has gone on without change, many vexations have come upon her, yet there has been but little recreation and no rest. Nature has yielded, the exactions were too great, and ten years have made the impression that thirty should. Sad indeed is this picture to contemplate, but, nevertheless, too often is it a copy from life. Had that young woman been diverted, had she had

some one to lighten her burden, some one to make her evenings pleasant, to relieve her of care, to give her a trip, to let her have some rest, how much more pleasing might the picture have been.

Let me draw still another picture. Let it be of the society woman, for she can dissipate in her way fully as well as the business man can in his, and the consequences will be equally as serious. Her social nature will at first suggest an afternoon tea, a game of whist, an occasional theater party, all of which is well and conducive to health, in moderation; but often there comes into her life social ambitions, so to speak, a desire to excel and outdo Mrs. A or B, and from innocent diversion and recreation she soon becomes absorbed and lost in a life of excess and dissipation. Night after night, day after day does the pressure continue. I quote from Robert Grant: "Her nerves are kept in a constant state of tension by breathless comings and goings, her digestion perpetually tried by the viands of festivities." She presently becomes a wreck, mentally and physically, though she presents a bold front to the world, until one day the news is flashed upon a busy public that she has died suddenly from "heart failure, following an attack of pneumonia." This woman, with much to live for, with a kind husband and sweet children, with plenty of money, has destroyed herself, and has allowed her social ambitions to wreck her life; what should have been recreation, what should have diverted and made life pleasant, what should have aided in helping to reach the allotted three score and ten was made an evil by excess and dissipation, and caused an early surrender to the inevitable. So could other pictures be presented, but the ones drawn will serve my purpose, and are so common that all of us must recognize them. Any long-continued or unreasonable tax, especially upon the nervous system, must cause disaster by injury to health, unless we remember that the strain must be relieved by occasionally taking rest, or by frequent indulgence in some form of recreation.

What is sadder than to watch the melancholy one, to see some sensible though nervous person look at life in such an

abnormal way, to believe the blessings given are but sorrows, and even to see such go on until life becomes unendurable, and at some depressed moment end the miserable existence by self-destruction! Few of us realize how insidiously the breakdown comes, and are not willing to admit that there is danger to himself, and will go on for months and even years until some organic disease is engrafted and the rest comes too late to be of benefit. If the best good is to be derived, the rest and recreation must come before the organic changes have occurred, and the thought of prevention rather than cure should be uppermost in the mind. The proper rest and recreation can be had in many ways, even for those in moderate means, and if the physician will appreciate and preach their necessity, applying to himself and his patients the danger of neglect, much good will be accomplished. True, the stamina of all differ; some require much rest, some but little. The man that uses his brain rather than muscle, the student, the scholar, the professional man needs rest more frequently than the phlegmatic or man who earns his livelihood by manual labor. The latter will often, year after year, under great physical exertion, keep in good health if his mind can be kept at rest, and the old age reached by many of them is a common observation. That seventh day given to all as a day of rest is appreciated by the manual laborer, and usually he will spend it in such a way as to attain that end; but with most professional men, especially with the physician, work goes on without interruption, and the rest never comes unless an earnest effort is made to have it. How difficult it is to follow this advice, no one appreciates better than I. How hard it is to get away, what loss will be involved, and many other thoughts come into his mind, and the effort seems insurmountable; but upon the other side we see the health giving way, mentally and physically, invalidism ahead, so the rest is decided upon. Probably a trip is taken; if not too long deferred, the object is attained, restoration to health, and that often means happiness.

But how prone are we to procrastinate until too late, the disease is established, and the trip can do but temporary if any good.

Let me here touch upon two conditions very common and terribly disastrous, if not recognized early and treatment instituted. Tuberculosis is the one, and functional nervous disturbances is the other. These, of all others, must be early recognized, anticipated if possible, and they often can be, and rest and recreation instituted in time. A recent trip to the West, where I met many invalids, emphasized with me the necessity of early effort, if good is to be accomplished. There I saw the so-called "one lunger" going from place to place, from high to low altitudes, from seashore to inland; cheeks flushed, eyes bright from hectic fever, form emaciated, respiration difficult, cough frequent, yet was he hopeful that improvement and even cure would result. How cruel must be the opinion given, how crushing when the dawn unfolds to him that nothing can be done, that his rest was taken too late, and he must go home to die; or perhaps he dies in the strange land, as I saw one do, with no loved one around him, with no one to close with gentle touch and tender affection the lids once covering those once bright and responsive eyes. Sad, heart-rending indeed is it to see these desperate people, wandering in search of health, sent by the physician, when he should have known that such advice was given too late, that had it been given a year sooner, cure might have been effected; but now organic changes have occurred, the disease has progressed too far, death must soon come, and kinder would it have been had he been left at home to die. Then how important it becomes to study well the pre-tubercular state, the condition that precedes consumption, that we may recognize the danger and give the proper advice at the proper time. That this condition ought to be more often recognized there is no doubt, and that it is not should stimulate the medical profession to greater effort. Consumption is responsible for one fifth of the deaths that occur throughout the globe, and in the United States nearly five hundred die every twenty-four hours. Only since 1882 has

the cause of consumption been known, Koch then announcing the discovery of the tubercle bacillus, and in many ways have our opinions changed relative to this fatal disease. We must realize that practically the tubercle bacillus is omnipresent; we meet it everywhere, in the home of the rich, in the hovel of the poor, in public places, in the city, and also in the rural district. So all must encounter and battle with this germ, and if weak and run down in general health, the tissues lack resistive power, the invasion is successful, and destruction will ensue, its rapidity depending upon many circumstances.

Any deterioration of health must be promptly investigated; never put off with the idea that things will soon be righted, and no effort will be required to get well. The health does not run down unless there is a cause; whether that be in the mode of life or the beginning of some organic disease will often require careful and patient investigation. The tubercle bacillus does not multiply in and destroy the lung of a healthy man; the soil must be favorable for its growth, and let me repeat that any thing that depresses the vitality aids in creating a culture bed, not alone for this one but for other germs. The organic lesion in consumption is usually preceded by more or less definite symptoms, but too often they are not heeded. The slight cough, the evening temperature, the too frequent pulse, the slight loss of weight, with an appearance of weakness, should, considered singly or collectively, cause anxiety, and every means known should be resorted to promptly that the true condition may be recognized. The microscope will often enable us to make an early diagnosis in pulmonary tuberculosis, usually before an examination of the chest reveals any deviation from the normal, so this valuable instrument must be used early and often when the slightest suspicion of tuberculosis exists. The physician should listen to and weigh carefully the symptoms presented by every patient, though they may at first glance seem trivial, though he may be hurried, feel tired or worried, and disinclined to listen to a long recital; yet to listen is his

duty, and the information received will often enable him to make an early diagnosis. And the patient should early seek the physician and have himself investigated and the meaning of all symptoms understood.

Let me now direct your attention briefly to the nervous system. How nervous most people are is well known, and that it is rare to find a well-balanced nervous system is true, the deviation from the normal being little or much. That the mode of life, that the worries encountered in the struggle for supremacy, that the hurried way we have of performing all duties are largely the cause for the many nervous people that exist.

When a mother becomes unreasonable and harsh with her child, when a wife is suspicious and exacting of her husband, when a husband is cross with his wife, and when they are together suspicious of neighbors and friends and look at things in general in a perverted way, there is surely sufficient evidence that something is wrong, and that something must be done to prevent further progress in the abnormal direction. If the lives of these people be analyzed, you will find that there is somewhere a strain, physical or mental; somewhere the exactions of life have been too great, no attention has been paid to rest, and the evenings of recreation have been too few to remember. True it is that there are many cranks, and that they will always be more or less cranky there is no denying, but even these unfortunate people can be made happier and less annoying to other people if the general health is kept up by yielding to nature's laws. If they have instilled into their lives some pleasure, the necessary rest be taken, they will be less cranky and often lose in large part their crankiness. We all know how dependent, one upon the other, are the physical and mental systems. That the greatest good must come when due attention is paid to both. A healthy body usually means a healthy mind, and an unhealthy body often leads to mental decay, although we do sometimes see great minds in bodies that seem inadequate. Sterne, in Tristram Shandy, says: "A man's body and his

mind are exactly like a jerkin and a jerkin's lining; rumple the one, you rumple the other." So it is the mind and body are mutually dependent; tax to excess either, and both must suffer; so both must have rest, and the mind, in addition, its necessary recreation. Jordan tells us, "Hurry is the scourge of America." "Hurry means the breakdown of the nerves." "It is the royal road to nervous prostration."

Nervous prostration is a popular malady, and the cases are frequent; the children, the old people, in fact, everybody seems liable to have this disease. It is usually caused by long-continued strain, is met with more often in girls and women, and its treatment is exceedingly tedious and unsatisfactory in the hands of the general doctor. Rest is essential in its management, whether by means of the so-called rest-cure treatment or in some other way, but at best the cases are trying to all concerned, to the doctor as well as to the family and friends.

The physician is about the hardest worked man I know of, and he often refuses to take rest for fear that he may lose practice, that some physician will be called in and continue as the physician of his former patients, even after his return to work. So he holds on, trying to keep up until his nervous system is shattered; he then too often resorts to stimulation, of one kind or another, that he may stand the pressure and exactions of his life; finally he must yield, and becomes a mental and physical wreck. Every physician should take rest and recreation, a month every year and two months if necessary; and he owes this to his patients as well as to himself and family. If he be nervous and in poor health, he can not render good service; he can not correctly weigh the evidence and exert the keen discrimination that is so necessary in the successful practice of medicine. How differently does he feel when rested and well, how pleasant to minister to those in need, to sympathize with those that need sympathy, to encourage those that need encouragement! How much better service can he render when the mind is healthy and bright, when enthusiasm aids in the performance of his routine

duties! The surgeon certainly operates better and is more helpful by words of encouragement after his vacation, an observation made not only by himself but by his patients and patients' friends.

Then admitting that rest and recreation are so essential to us all, as well in health as in disease, it becomes the duty of physicians to emphasize the truth and to point out as best they can what they are, and how rest and recreation can be obtained. Rest and recreation, and they are as twins, mean generally relaxation; mean the dismissal of unpleasant thoughts and the acceptance of pleasant ones; mean change from the routine life to something that attracts and interests; may mean change from one labor to another, from the scenery of the plain to that of the mountain, from the land to the sea; they mean the cultivation of cheerfulness and the weighing of all things in the balance of the philosopher; the necessary hours of sleep and the proper exercise of the body and mind.

Rest is not quitting
The busy career;
Rest is the fitting
Of self to one's sphere.
'Tis the brook's motion,
Clear without strife,
Fleeting to ocean
After this life.
'Tis loving and serving
The highest and best;
'Tis onward unswerving,
And this is true rest.

Rest for one may be unrest for another, so the rest of every man must be a study. The temperament and natural bent of all must be considered. Some of us like the theater, some believe it sinful; some are soothed by music, others are made nervous; some are rested by outdoor life, others by living indoors, and so on. Thus it is impossible for us all to obtain rest in the same way. With the person in affluent circumstances the problem is not difficult; he can travel, indulge in much that money can

supply. With the majority of people, however, those who must work to live, those whose incomes only yield an amount sufficient to furnish the necessities, the problem of securing recreation and rest is more difficult. But even here if their necessity be appreciated much will be accomplished. A poor man can cultivate and form cheerful friendships, he can carry to and receive from his own fireside cheerfulness and happiness, he can stroll with his wife and babe into the park and woodland, cultivate and enjoy the beauties of nature, forgetting the cares of his everyday life, and often gain recreation and rest by the creation of pleasant impressions. Worry and irritation cause unrest and must be eliminated, in part or at times, that rest may be secured. Recreation can be had without great expenditure: An evening at the theater or opera, something to cause forgetfulness of self, something to laugh at; so pleasant, so refreshing, a tonic to the mind and a reflex help to the body. How much happier one feels after an evening with Jefferson or Goodwin, or Sol Smith Russell. If a lover of music, how delightful to be wooed by Apollo, and to listen, enraptured, with cares and worries cast to the winds, and drink in the sweet notes vibrating from lyre or cithara, or to listen to Patti or Gerster, and to drink in the exquisite notes, enchanted, but lost to the world and every care about us.

To the busy man a good book will afford recreation and give a healthful stimulus to the mind; an hour with Dickens or Irving will enable one to forget the routine daily life, will give pleasure and do good. With the good public schools found in almost every community, with the public libraries to be had in the large and small cities, with the cheapness of books, magazines, and newspapers, there can be no reason why even the poor can not enjoy the recreation and rest that come from judicious reading. When business cares bear upon us most heavily, when the friction of life is greatest, when the trials are hard to withstand, when the grind for existence must, apparently, keep the shoulder at the wheel, then it is I beg of you to heed the warn-

ing, take the rest, no matter what difficulties are encountered; a few weeks well spent may save much time in the end. We must not forget that happiness, contentment, and rest come from doing good, aiding somebody, doing to others as you would be done by; no contentment is greater, nothing is so satisfactory as to know a duty has been well performed, good has been accomplished, somebody has been made happier. Take this from the physician's life, and there can be but little left; to be kind, to attend the sick, to use every effort for the patient's restoration, is simply a duty; but how comforting, how restful is it always to accomplish something and feel that your efforts have helped, and then how delightful when appreciation is shown, and with tears of gladness in her eyes and love in her voice, the wife or daughter comes to thank you for saving the one so dearly loved. What recompense so great, what rest so complete, what tonic so invigorating as the words of that wife or daughter. When the clouds lower, when every thing is dark, and no brightness can be seen ahead, when life's burden seems about to overwhelm us, the layman and the physician can have some respite by recalling the good deeds performed, and nothing can help more in the battle with the future than the rest gained from such healthful meditation.

CEREBRO-SPINAL MENINGITIS IN HENDERSON COUNTY.

D. O. Hancock, M. D.
Henderson, Ky.

Headache, backache, nausea, vomiting, constipation, delirium, depression, and fever are common to us, as we go among the afflicted. But when headache becomes agonizing, backache lancinating, delirium is followed by coma, depression by exhaustion, and accompanying or immediately following these we have rigidity or contraction of muscles of nucha and back, flexion of the extremities, irregularity of the pupil, paralysis, with possibly discolored or spotted skin, we have to deal with a specific, infectious, pandemic disease, ghastly in appearance, fearful in its progress, and terrorizing in result, cerebro-spinal meningitis, or, if you like, epidemic cerebro-spinal meningitis, cerebro-spinal fever, or spotted fever.

History. Reliable history of this disease is limited to literature of the present century. It first appeared epidemic in Geneva in 1805. But little is written of this malady until 1860, since which date epidemics have occurred in nearly every civilized country.

Etiology. Whatever may be said of cold, heat, moisture, latitude, season, etc., as factors or predisposing causes of epidemic cerebro-spinal meningitis, it is generally accepted that a specific virus is the true cause of the disease.

The pneumococcus or a micro-organism identical with or indistinguishable from it has repeatedly been found in the meningeal exudation. This by some was accepted as conclusive. The micrococcus lanceolatus, as described by Flexner and Barker in 1895,

occurring in all cases of an epidemic in a mining town in Maryland, has enjoyed the confidence of a respectable number of the profession. Other bacteria are, however, constantly found associated, which gives much reason for doubt. In 1887 the diplococcus intracellularis was found in a number of cases of cerebro-spinal meningitis, and in 1895 was again given a careful study. Subsequent investigations show this organism to be distinct from the pneumococcus and different from the micrococcus lanceolatus, if they be not the same. Isolation, cultivation, and experiments indicate that the diplococcus called meningococcus is the true cause of this malady.

Contagion. Our knowledge of the contagion as obtained from a careful review of the more than one hundred reports of cases occurring in Henderson and Henderson County, Ky., during January, February, March, and April, of 1899, is not materially different from reports of other outbreaks of this disease. As is true of every other endemic disease, cases have occurred in the best homes, and where none but best surroundings were allowed, the majority of cases occurring among the poor and crowded. Obvious reasons explain why this should be. The distribution of this endemic as compared with our geography is that few cases have occurred in localities high and distant from large streams or large bodies of lowland. No cases are reported from Robards and Anthoston, but one from Cairo, and only a few in the large territory between Corydon, Dixie, Poole, Robards, and Niagara. Quite different have been the reports from Geneva, Wilson, Basketts, and Henderson. And in these localities most of the cases have occurred in ill-ventilated and overcrowded houses found in hollows, sags, flats, and poorly-drained places or adjacent to them. It appears that the meningococcus here most successfully develops and propagates. Its manner of entrance into the human system, the condition of subject most favorable to the contraction of the disease, and the period of incubation are alike unknown to us. Certainly an atmosphere sufficiently impregnated with meningococci, a subject in proper

condition, and a period of incubation precede every case of cerebro-spinal meningitis. This disease is not acquired by direct contact with or proximity to a patient suffering with it. Physicians in Henderson and the county during this epidemic spent many hours by day and night with it. Nurses and attendants were constantly in sick-chambers, some slept on beds with the patient, yet no physician, nurse, or attendant in our city or county has subsequently had meningitis. In a few instances more than one case has occurred in the family. One a mother, age forty years, was taken Thursday and died Sunday. Her child two years old was taken Friday, next day after the mother, and lived six weeks. In another family a child, aged eight, recovered in two weeks. His brother was taken five weeks afterward, and died in twenty-six hours. We have found no evidence of its transmission from one person to another, from one family to another family, or from one locality to a different locality.

Pathology. We have a number of acute infectious and contagious diseases, caused by well-known micro-organisms, which diseases run definite courses, and are characterized by constitutional disturbances and localized inflammations of lung, gut, throat, etc., according as we have pneumonia, typhoid fever, diphtheria, etc. In the same category we find cerebro-spinal meningitis, an acute infectious disease, due to the meningococcus, which either directly or by its products in the system causes constitutional disturbances and inflammation of the covering of the brain and spinal cord, with a long train of symptoms, and results according to the severity of attacks. Accepting this statement, the pathology of the disease is suggested to us, and has been verified by numerous autopsies, as given in our literature.

The systemic toxemia is of great concern in every case. Depression, prostration, and even collapse are familiar to all who have treated meningitis. Our knowledge of anatomy and physiology will suggest the manner of procedure adopted by the germs to bring about these conditions.

Inflammation is inflammation, "the response of living tissue to injury." The injury now under consideration is unfortunately near vital centers. Pain may not kill, redness and heat may be of minor consideration, but swelling and exudate will paralyze and destroy. Speedily fatal cases show leucocytes immediately around the cerebral vessels and round cells in the cortex of the brain. Often evidence of encephalitis is present. Arteries, veins, and sinuses are engorged. The ventricles are distended with liquid; the vessels and network of the pia mater are filled, and the subarachnoid space may contain a layer of fibrin. This liquid, at first serum, frequently contains red blood cells. The brain matter is congested, and sections of the gray matter may present punctate extravasations. With this condition at headquarters and down the back, mechanical pressure on the vital centers, extension wherever possible along the outgoing nerves, reflex pain, and virulent systemic poisoning, we have the fulminant form, as it is sometimes called. We fold our hands and say, "the Lord giveth and the Lord taketh away." Some first apply a bag of hot potatoes.

This condition of pressure and poisoning may not be sufficient to overwhelm, and at the end of the usual period of inflammation we have resolution and recovery. Or we may have a secondary inflammation covering the same period of time. Even a third or fourth extension of the inflammation may occur, but if resolution does not occur at the end of about nine days, suppuration supervenes, and we have a septic condition as a prominent factor. Pressure and extension of inflammation and suppuration may cause blindness, paralysis, and all the other grave and minor symptoms and sequelæ to this dread malady. To take up each symptom and result and show how and why it is produced, the location of the lesion which causes certain forms of paralysis or blindness, or fever, or apyrexia, or reflex pain, is an inviting field which must be passed by for the present. Nor will I take the liberty of speaking of forms, diagnosis, prognosis, or treatment, which are to be presented in the next paper on our programme.

Our reports are of 107 cases occurring in Henderson and the county. Of this number 53 are males, 54 females.

Under 10 years of age, 38; between 10 and 20 years of age, 14; between 20 and 40 years of age, 48; over 40 years of age, 7.

Seventy per cent of these 107 cases have died; 30 per cent still live.

Of deaths before 10 days, 28 per cent; of deaths between 10 and 20 days, 33 per cent; of deaths between 20 and 40 days, 34 per cent; of deaths after 40 days, 5 per cent.

I have reason to vouch for the correctness of the diagnosis in every case so reported. The profession in Henderson have been conservative in the diagnosis of meningitis. I express the opinion of a number of physicians in Henderson when I say that very many cases of meningitis in our locality have not been reported because of their mildness. Several patients died within twenty-four hours from initial chill. Again, some few cases have been protracted to sixty, eighty, and even one hundred days. These long-drawn-out cases have died or continue sick. A few recoveries after twenty-five or forty days have been noted.

Thus we have endeavored to present you somewhat of definition of this disease, as has been suggested by our recent endemic. We have hinted at its history and presented its etiology as it is given in the latest literature at our command. The evidence, as it appears from the geographical distribution of this disease in Henderson County and its occurrence and history in individual cases, of the correctness of this etiology is given. The possibility of meningitis' being contagious has occupied a good part of our thought. A reference to the pathology is given only as it may better help us to understand the different forms and many of the symptoms and sequelæ which are presented to us. A digest of these 107 cases is given with the hope that it may be of some interest to members of the Kentucky State Medical Society.

CEREBRO-SPINAL MENINGITIS.

By T. D. Williams, M. D.
Bardstown, Ky.

Historic Note. The prevalence of this disease during the past winter and spring in various sections of Kentucky, with its seventy-five per cent mortality, has no doubt awakened new interest and investigation with the medical profession, especially of this State. Almost a century has elapsed since we had the first clear description of the disease as it appeared in epidemic form; and from that time till now it has prevailed in almost every civilized country of the world, and yet its etiology and pathology seem shrouded in mystery; hence the treatment of the disease is most unsatisfactory.

Definition. Cerebro-spinal meningitis is a specific infectious and slightly, if at all, contagious disease, characterized anatomically by inflammation of the meninges of the brain and spinal cord, and clinically by an exceedingly irregular course of fever, severe pain in the head and back, often in the trunk and extremities, contractions of the muscles of the nucha and back, hyperesthesia, vomiting, delirum, coma, and often various skin eruptions.

Etiology, Bacteriology. I believe the disease to be of microbic origin. Evidence seems to point to the micrococcus lanceolatus as having an etiological relation to the disease; its presence having been demonstrated in both the sporadic and epidemic forms of the disease. Whatever the exact nature of the micro-organism may be, assuming its existence, it evidently is of widely diffused occurrence, and has its growth favored by moderate temperature and by moisture. Now, if the germs are scant

in numbers or feeble in virulence, they are inoperative or affect only susceptible systems, thus producing isolated cases of the disease; but when local and atmospheric conditions favor, it acquires such concentrated intensity as to act uniformly and violently upon those who receive the virus into their systems. It is claimed by high authorities (Hirsch, J. L. Smith, and Kohlman) that a specific poison may attach to certain houses, localities, and to clothing, rendering them infectious. How the virus enters the economy has not been determined. Strümpell suggests that auto-infection may take place through the nasal fossa; Flexner and Barker, that it may occur through the intestine.

Diphtheria will starve to death on fresh air and sunshine, and fatten on sewer gas and dark, gloomy houses. I have seen several cases of cerebro-spinal meningitis developed in dark, gloomy houses with bad sanitary conditions. It has often appeared in illy ventilated habitations, among the poorer classes dwelling together in tenements, among soldiers crowded together in barracks, and among prisoners.

Excessive mental and physical exertion or bodily fatigue, as after prolonged marching, may heighten the susceptibility to the disease. It has been most prevalent in the northern regions of the temperate zone, while unknown in the tropics. The greater number of outbreaks have been in winter and spring, and have developed in exceptionally severe weather. Children and young adults are most susceptible to the disease; though no age enjoys perfect immunity. Some epidemics have affected adults chiefly. This seems to have been the case in Kentucky, persons about fifty years of age having been oftenest attacked. J. L. Smith found from the Reports of the New York Board of Health that children under one year of age furnished the largest mortality. All published statistics show that a large proportion of attacks occur under five years, and that a larger proportion of fatal cases are in the first year than in any other year. The cases seen and treated by myself ranged in ages from eight months to eleven years; males and females about equal. Nearly

all my cases were found in cabins, rudely constructed and poorly ventilated. The sanitary conditions were defective. The houses were located in flats or damp lands near rivers. In some instances unwholesome food and water were noticeable. Malarial diseases had prevailed regularly during the spring, summer, and fall in these sections.

Morbid Anatomy. My experience has been in country practice, without opportunities of making post-mortem and microscopical examinations, hence I can not say much about the morbid anatomy. About eight years ago I saw my first and only case of the fulminant or malignant type of the disease. The violence of all the symptoms and the sudden death of the patient completely upset me. In this case vision was totally impaired when I first saw him. The right eye was excessively congested and protruding. He voided bloody urine a few hours before death. A full report of the case will conclude this paper.

Fulminant Form. No acute disease, cholera scarcely excepted, may kill with such rapidity as this form of the disease. Cases are on record that died in five and ten hours. The attack is generally without warning, and the seizure is abrupt, with severe chill and agonizing pain in the head and back, nausea and vomiting, high fever and active delirum, followed by great depression of the vital functions, gradual somnolence, rigidity of the muscles, or even general convulsions.

Common Form. This form usually sets in abruptly without prodromal symptoms; chill, headache, and vomiting. The headache is usually severe and accompanied with great sensitiveness to light and noise. The headache may be diffused all over the head or confined to the occiput. Headache is one of the most constant features of the disease. The temperature rises rapidly, and may reach 103° or 104°, sometimes higher; but occasionally, even in severe cases, the pyrexia at the outset or during the course is not of a high grade, but may remain and run as a mild grade of fever. The pulse is full and strong, later irregular, and, when symptoms of depression occur, feeble and rapid. The

pyrexia, which has no fixed type, does not really bear any relation to the severity of other symptoms.

Abortive Type. The attack may set in acutely, with high fever, severe headache, photophobia, but in a few days all these symptoms subside and rapid convalescence is established.

Diagnosis. During an epidemic the recognition of the disease is easy, and the description of the anomalous types is now so clear that they, too, are not often overlooked. On the other hand, mistakes often arise in the sporadic form, but cases of other acute infectious diseases are more often diagnosed cerebro-spinal meningitis than are cases of this disease overlooked.

Prognosis. The prognosis is influenced especially by the degree of severity of fever and the intensity of the nervous symptoms, especially the vomiting, coma, headache, opisthotonos, character of respirations, etc. Complications of pneumonia or suppurative inflammations of the pleura or pericardium or lesions of the special senses may affect the prognosis. In very mild cases the duration is from four to five days. The most malignant type runs a rapid course, and usually ends fatally. If recovery takes place at all, it is after a long, serious, protean illness, with various complications and sequelæ as a rule. The abortive form is necessarily of brief duration. In the common form, convalescence usually begins at the end of one or two weeks, though not a few cases are met with in which the latter period is much delayed, with slow convalescence, hindered by numerous complications and sequelæ. In children of one and two years of age the disease is very fatal, these ages giving the highest mortality rate. Between two and five years and after thirty it is a more serious disease than during young adult life. The mortality of cerebro-spinal meningitis runs from 25 per cent to 75 per cent. It has been estimated at 75 per cent in the sections of Kentucky where the disease prevailed in the past winter and spring.

Prophylactic Treatment. As the disease is often associated with unsanitary conditions, the thorough cleansing and disinfec-

tion of all suspicious localities, streets, alleys, and badly ventilated houses and all their surroundings should receive prompt attention, and those who are in feeble health should be removed from such unhealthy places. The patient should be isolated, and the sick-room should be quiet and somewhat dark. Noise and excitement should be prevented. The patient should not leave the bed until convalescence is assured. The rules that have always been effective to prevent the spread of infectious diseases should be strictly observed and enforced. The diet should consist of nutritious liquids, milk, and animal broths. When convalescence begins, semi-solid substances, rice, eggs, and milk toast are admissible, and free allowance of water all the time.

Medicinal Treatment. Many and widely various modes of treatment have been advocated by as many different authors, but it is best to treat individual cases according to the special indications presented. Pain demands our first attention. Opium in some form meets this condition best. The system generally is very tolerant of this remedy, and it is remarkable how much some sufferers can bear without narcotism. The hypodermic method is superior and quicker than other methods. Morphin affords prompt relief from the severe headache, myalgic pains, and muscular contractions and other nervous symptoms, and at the same time spares the heart. If the respirations are weak and irregular, atropin should be used with the opiate. If the heart threatens failure, strychnin is indicated. Ergot and belladonna are useful and efficient remedies early in the disease to lessen the congestion of the cerebral capillaries. In children the bromids are efficient remedies. If there are convulsions, or they threaten, chloral should be used. The deodorized tincture of opium, papine, and even morphin for children are among our most useful remedies. Opiates, even in young subjects, are at times remarkably well borne. Constipation calls for purgatives, and calomel and extract of colocynth are among the best agents, aided by copious enemata of warm soap-water. After the effusion

of the exudate has taken place, the narcotics are to be replaced by remedies that promote absorption, such as the iodids of potassium and sodium and the bichlorid of mercury.

Stimulants are indicated when signs of heart exhaustion appear, and should be freely given in accordance with the rules in other acute infectious diseases. Cold should be used locally, since it is both of value and very grateful to the patient. Ice-bags should be put to the head and to the entire length of the spine. Mixing bran and ice together and filling sacks with it and placing to head and spine is an easy and efficient way of applying cold. In some cases of asthenic type blisters may be applied to the nape of the neck or over the mastoids. If used at all, they should be used early in the attack. I question their utility.

Report of Case. D. G., a stalwart negro man, aged twenty, height six feet, weight one hundred and eighty pounds, a farm laborer, previous health good, was attacked January 20, 1891, between the hours of twelve and one at night, with a violent chill, pain in the head and back of a severe character, nausea and vomiting, with a general nervous and restless condition. The white family with whom he lived were intelligent and kind, and administered faithfully and well to his sufferings for several hours, giving him several doses of laudanum, whisky, and quinine. The case grew worse, and I was sent for and arrived about daylight. I found him delirious and unconscious, and suffering untold agonies in the head and back, with excessive tenderness all along the spine. The right eye was so badly engorged that it seemed bulging from the orbit. Vision was destroyed. The head was drawn back and to one side. I at once gave morphin and atropin, and ordered mustard plasters applied to the wrists and ankles. Had the spine rubbed with hog's lard, spirits of camphor, spirits of turpentine, and coal oil. Placed calomel on tongue every hour for the purpose of moving bowels. Had several copious warm soap enemata given. The tongue was coated. Bowels constipated. Failed to move bowels.

Had to repeat opiate and atropin every one to two hours to control suffering. By ten o'clock A. M. he was profoundly comatose, and lingered in this condition till five o'clock P. M., when death ended his sufferings, some sixteen hours after the attack. The house in which the patient lived was comfortable and well ventilated, and the sanitary surroundings were perfect. This patient voided bloody urine a few hours before death. No other case of the disease occurred in the neighborhood that winter. This patient took six grains of morphin in thirteen hours, this amount being necessary to control the excruciating pain. No marked narcotic effect was produced.

REPORT OF A CASE OF EPIDEMIC CEREBRO-SPINAL MENINGITIS TREATED WITH ANTI-STREPTOCOCCIC SERUM.

By J. D. Maddox, M. D.
Rockport, Ky.

O. T. Hines, white, age 45, blacksmith. Family history good. Has had good health until in January of this year, 1899, he had an attack of catarrhal fever which kept him in bed for about one week and in his room two weeks longer, with a slow convalescence covering two to four weeks more. He had, however, fully recovered from this at time of the present illness.

On March 21, 1899, at about 4 o'clock P. M., he began to feel chilly, which soon became a more pronounced chill, accompanied with a feeling of illness. He left his shop about 5:30, went home and to bed. He had very considerable fever through the night.

At 9 o'clock A. M. of the 22d I was asked to see him, and was accompanied by Dr. S. S. Jackson. We found him with a temperature of 100° F., pulse 90; tongue broad, thick, pale, with white coating, not very heavy, and moist. He had vomited twice through the night. He was complaining of slight pain in head, a more pronounced pain in back, hips, and legs; but did not have the appearance of being very ill. None of the pains was severe.

The diagnosis was catarrhal fever (la grippe). Ordered: Hydrarg. sub-chloridi, grs. viij; sodii bicarb., grs. xx. M. ft. chart. No. iv. Sig: One every two hours; the last dose to be followed in six hours with magnesii sulph., one tablespoonful in half tumbler of water. He had taken quinine sulph., gr. iij,

before I was called, and he was instructed to take the same amount in two and four hours. He was also instructed to take a powder containing acetanilid, grs. iv, and caffeini citrat., grs. ij, every three hours until relieved of the pains in the head, back, and limbs. The directions were followed, and during the day he felt so much improved that he rose from his bed, sat by the fire, enjoyed a pipe of tobacco, and told his wife that he would be able to go to his work the following morning. That night he rested well until about 1 o'clock A. M. of the 23d, when he again complained of pain in the head. At 2 o'clock the bowels moved the first time, and he complained of being chilly and of still more pain in the head. His wife gave him one of the powders of acetanilid and caffeine citrate to relieve the pain in his head, and a dose of the quinine to stimulate him. At some time between 4 and 5 o'clock his wife noticed him talking rather strangely, and asked him what he was talking about. Receiving an unsatisfactory answer, she questioned him further and discovered that he could not talk at all; he only mumbled and muttered. She immediately sent for me.

At 5 o'clock I found him with eyes open as if awake, perspiring copiously, skin warm, temperature 100° F., pulse 100, tongue much smaller than on the preceding morning, brown coating and *dry*; pupils slightly dilated and reacting very slightly and sluggishly to light; no photophobia. He seemed to comprehend and understand questions, and tried hard to answer, but could not speak an intelligible word. After trying several times to answer each question he would wearily close the eyes and appear to sleep. He was as easily aroused as if well, and when asked to extend the tongue or open the mouth or drink water he readily obeyed, but when asked to look at me he seemed not to be able to locate me, and would try to look back over his head in search for me. I suspected epidemic cerebro-spinal meningitis, and asked Dr. Jackson again to see him with me at once, which he kindly did, as well as to assist in treating the case through. He agreed with me in my fears as to the nature of

the trouble. We gave him pot. bromidi, grs. xv, and repeated it in one hour. We also decided to give atropinæ sulph., gr. $\frac{1}{120}$, to check the profuse sweating (and it was indeed very profuse). But by the time I could get the atropine, about half an hour, the sweating had ceased and the skin was dry. I withheld the atropine until we saw him again in two hours, or about 6 o'clock A. M. of the 23d. We then found him with a temperature of 97°, pulse 81; skin cold and clammy; mental condition unchanged. In half an hour more the condition was the same, except that the temperature had risen to 99° and the pulse to 106, which was now as hard as a whipcord. We gave the atropine, gr. $\frac{1}{120}$, at 8 o'clock. The bowels moved again about 9 o'clock. The atropine restored the capillary circulation, but produced no other change. Between 9 and 10 o'clock he grew restless, soon making efforts to get out of bed. I telegraphed for Dr. John J. Mitchell, of Beaver Dam, Ky., who arrived at 11 o'clock A. M. By this time our poor patient was in constant motion, lying on the face with the knees folded up against the abdomen and the arms under the chest; then rising straight up in bed, standing on the knees; then trying to lie on the side, and occasionally slowly raising both hands to his head and rubbing the head and back of the neck as if in great pain. The motions were all slow because all the muscles were now more or less in a state of tonic convulsion, which condition began to show as early as 9 o'clock, the only distortion noticed being in the right hand. There was at no time, even until near death, opisthotonos, the opposite condition prevailing most of the time, but the neck was rigid after the forenoon of the 23d. There was now no doubt of the nature of the disease (at 11 o'clock), and he was given morphinæ sulph., gr. $\frac{3}{8}$. Within half an hour the patient was perfectly quiet, lying on the left side and inclined to pronation, with the legs drawn up and the arms flexed, and all muscles rigid. It was now impossible to rouse him.

At 6 P. M. of Thursday, 23d, he was given 10 c. c. of P., D. & Co.'s anti-streptococcic serum, which was furnished me

through the kindness of Dr. J. S. Smith, of McHenry, Ky., and Drs. John J. Mitchell and S. D. Taylor, of Beaver Dam, Ky. It was injected beneath the skin of the abdomen. At 7.30 P. M. he changed his position slightly, the first voluntary motion in about eight hours. During this eight hours (at about 2 o'clock), he was given atropinæ sulph., gr. $\frac{1}{120}$, to stimulate the capillary circulation, the skin being cold and clammy, and in an hour, at 3 P. M., the skin assumed a good color. Between 7.30 and 8.30 P. M. he changed position several times, and when I visited him at 9 P. M. I found him lying flat on the back, legs straight, arms raised, and both hands under back of the head, breathing regularly and easily, and to all appearances sleeping as naturally and peacefully as a babe. He was easily aroused, and could answer questions with fair intelligibility.

The improvement in his speech, or rather in *the power to speak*, had begun about an hour before, according to the nurse. The speech and mental condition continued to improve on through the following day (24th), so that during most of the day he conversed intelligently, although the mental action seemed sluggish.

At 7.30 A. M. of Friday, 24th, he was given the second 10 c. c. of the serum, and while there was not so marked a change as that following the first dose, the general (apparent) improvement continued through the day as above stated.

The following are the notes from 11.30 A. M. of the 24th (the first having been misplaced):

24th, 11.30 A. M. Pulse 76, good; respiration 20, regular. Given: Strych. nitrat., gr. $\frac{1}{40}$; morph. sulph., gr. $\frac{1}{4}$; atrop. sulph., gr. $\frac{1}{300}$. Complains of pain in back of head. Some improvement in speech.

3.30 P. M. Pulse 60; somewhat restless; pain in front of head; speech improved. Given: Strych. nitrat., gr. $\frac{1}{40}$; morph., gr. $\frac{1}{8}$; atrop. sulp., gr. $\frac{1}{300}$.

6:30 P. M. Restless since last visit; morph., gr. $\frac{1}{4}$; atrop., gr. $\frac{1}{250}$. Urine 16 fl. oz., lighter in color.

The urine had been drawn with catheter several times before this every ten hours. But the profuse sweating having ceased and the patient now taking plenty of water, and a half tumbler of milk every three hours, more urine was secreted, and a full bladder was probably the cause of the restlessness between 3.30 and 6.30.

25th, 12.15 A. M. Pulse 72, strong, full; resp. 18; skin cool, sweating slightly. Given: Strych. nit., gr. $\frac{1}{40}$; atrop., gr. $\frac{1}{150}$ morph., gr. $\frac{1}{4}$; and the third 10 c. c. of serum; this time in thigh and buttock.

5.45 A. M. Pulse 60; skin dry. Temp. in axilla 100.2°; muttering delirium. (Temperature had not been taken regularly because of the uncertainty in getting correct register, and because it was thought no fever existed; but a number of registers were lost with notes; at 4 A. M. he had got on chamber and emptied bladder well, and had good action from bowels.) Given: Morph., gr. $\frac{1}{8}$.

7.35 A. M. Temp. 99.4° under the tongue; pulse 68, and full.

9.20 A. M. Temp. 102.5°; pulse 64; strych. nit., gr. $\frac{1}{40}$; morph., gr. $\frac{1}{4}$.

11.40 A. M. Temp. 102°; pulse 72, full and regular; pain in head. Given: Acetanilid, gr. ij., caffeini citrat., gr. j.

2.15 P. M. Temp. 99°; pulse 64. Given: Morph., gr. $\frac{1}{4}$; strych. nit., gr. $\frac{1}{40}$, and ordered whisky, one-half ounce every two hours.

4 P. M. Temp. 100.2°; pulse 60, irregular; slight sweating; tongue moist (has been dry since A. M. of 23d, and on this account the atropia was gradually withdrawn; but the tongue remained moist only a few hours). Resting quietly; speech fairly good; pain in head after being aroused from sleep; urine, 16 fluid ounces, with catheter, lighter in color than last drawn. Ordered hydrarg. bichloridi, gr. $\frac{1}{20}$ every five hours, and this was taken regularly, as was also milk, water, and whisky as long he could be induced to take them.

6.15 P. M. Temp. 99.2°; pulse 72; more delirious; morph., gr. $\frac{1}{4}$.

10.10 P. M. Temp. 99.8°; pulse 68. Given: Morph., gr. $\frac{1}{4}$; strych. nit., gr. $\frac{1}{40}$.

At this juncture Dr. G. A. Pirie, Resident Physician at the Gray Street Infirmary, of Louisville, arrived and took charge of the case as nurse, and to him I am indebted for the intelligent and scientific care of the patient, as well as for the splendid record and notes and valued suggestions as to treatment.

It will be noticed that no serum was given from midnight of the 24th (or 12.15 of the 25th) until 11.20 A. M. of the 26th—thirty-five hours. The reason for this was that a second supply was telegraphed for at Detroit as soon as there was apparent good results following the first dose, and it was until then reaching us.

DR. PIRIE'S NOTES.

1899. March 25th, Saturday, 10 o'clock P. M. Temp. 99.4°; pulse 68; resp. 17, and slightly stertorous. Morph., gr. $\frac{1}{8}$; strychninæ, gr. $\frac{1}{60}$ every four hours; whisky, half ounce every hour; milk, 2 ounces every three hours.

11.30 P. M. Pulse 72; resp. 19; divergent squint; low, typhoid delirium.

Sunday, 26th, 12.30 A. M. Temp. 104°; pulse 104; resp. 24. Tinct. aconite, 2 minims.

1.30 A. M. Temp. 100°; pulse 94; resp. 20; catheterized 10 ounces high-colored urine.

3.00 A. M. Cheyne-Stokes respiration; slight voluntary stool.

4.00 A. M. Pulse 81; resp. 20.

5.00 A. M. Temp. 101°; pulse 80; resp. 22; copious voluntary stool.

6.30 A. M. Temp. 100.8°; pulse 82; resp. 21; profuse cold sweating.

7.00 A. M. Pulse 124; resp. 24; face flushed. Tinct. aconite, 2 minims; cold to head.

7.10 A. M. Three involuntary actions since 5.00 A. M.

7.30 A. M. Temp. 99°; pulse 104; resp. 22; pulse irregular and thready.

8.15 A. M. Temp. 99.6°; pulse 88; resp. 24.

11.20 A. M. Temp. 103.2°; pulse 88; resp. 26. Antistreptococcic serum 10 c. c. in walls of abdomen, followed by trinitrin, gr. $\frac{1}{200}$, hypo.

11.45 A. M. Morphinæ, gr. $\frac{1}{4}$, hypo.

12.30 P. M. Pulse 85.

1.00 P. M. Pulse 84.

2.30 P. M. Pulse 81.

3.30 P. M. Temp. 100.4°; pulse 83; resp. 24; occasional restless tossing; muscular twitching; hands extended above head.

4.00 P. M. Temp. 100°; pulse 76; resp. 24; mental condition improved; catheterized 10 ounces of high-colored urine.

5.00 P. M. Pulse 78.

6.30 P. M. Pulse 74.

7.30 P. M. Temp. 101°; pulse 72. Antistreptococcic serum, 10 c. c., in thigh.

8.30 P. M. Temp. 99.6°; pulse 84; resp. 22.

9.30 P. M. Temp. 100.4°; pulse 89; resp. 30.

10.30 P. M. Temp. 101.8°; pulse 106; resp. 30.

11.00 P. M. Temp. 103.2°; pulse 120; resp. 36.

11.30 P. M. Temp. 102.8°; pulse 120; resp. 24.

12.00 P. M. Temp. 103°; pulse 121; resp. 26.

Monday, 27th, 1.00 A. M. Temp. 101.8°; pulse 117; resp. 22.

1.30 A. M. Temp. 99.6°; pulse 112; resp. 24; bowels moved involuntarily throughout the night.

3.30 A. M. Antistreptococcic serum, 10 c. c. (not noted by Dr. Pirie). This was the sixth and last dose of the serum.

4.00 A. M. Temp. 102°; pulse 130; resp. 30; pulse and temperature gradually increasing.

5.00 A. M. Temp. 102°; pulse 135; resp. 36. Tinct. aconite, 2 minims; respiration shallow and labored; delirium marked, and of typhoid type; squint continues.

6.00 A. M. Temp. 101.8°; pulse 146; resp. 43; patient can hardly be roused; swallowing difficult. Hypo. of trinitrin, gr. $\frac{1}{200}$.

7.00 A. M. Temp. 103.6°; resp. 43; catheterized without result.

8.00 A. M. Pulse 180; nystagmus; right pupil dilated; perspiring.

8.05 A. M. Resp. 46. Trinitrin, gr. $\frac{1}{100}$, hypo.

8.13 A. M. Temp. 104°; resp. 52; both pupils dilating—right more than left.

8.25 A. M. Temp. 104.4°; failing rapidly; pulse absent at wrist. Torticollis; muscles rigid.

8.45 A. M. Temp. 104°; pulse 170; resp. 50; moaning and raising hands to head; breathing loud.

9.00 A. M. Temp. 104.25°; resp. 52, Cheyne-Stokes.

9.15 A. M. Temp. 104.6°; resp. 60.

9.25 A. M. Temp. 106°.

9.27 A. M. Opisthotonos lasting a few minutes; risus sardonicus; coffee-ground vomit.

9.30 A. M. Temp. 106.5°. Death.

CEREBRO-SPINAL MENINGITIS: REPORT OF A CASE.

By L. C. Royster, M. D.
Henderson Co., Ky.

Wm. Frederick, a twin boy ten years old, of German parentage, was taken with cerebro-spinal meningitis on February 20th last. I saw him March 1st, in the afternoon. The history, as given by the parents, was that he had been very restless ever since he was taken, had slept none the night before, had tossed from one side of the bed to the other, and complained of a boring, lancinating pain in the head, accentuated in the middle of the forehead, had high fever but was not delirious.

I found the boy pretty much in the condition above described, with a temperature of 103.5°, pulse 100, pupils normal, tongue heavily coated, bowels constipated. I prescribed acetanilid 1 gr., with morph. sulph. $\frac{1}{30}$ gr., every hour until relieved. I also gave an active cathartic to be given at bedtime, to be followed by quinin bisulph. when fever was reduced. I also ordered sponge baths with cold cloths applied to the head. I saw him again the next morning, with no material change in his symptoms except his fever (temperature 101°, pulse 90); had spent a restless night, slept but very little; bowels had moved freely. Meningitis was suspected. I was sent for in the afternoon of the same day, and found his symptoms exaggerated, with head slightly retracted, pupils dilated, conjunctiva injected, intolerance to light and sound. Diagnosis, cerebro-spinal meningitis. I withdrew quinin, ordered ice-bag to his head, mustard to his spine, hot-water bottles to his lower extremities, increased morphia to $\frac{1}{18}$ gr. every two to four hours until relieved.

When I returned the next morning I found he had spent a comfortable night, was perfectly rational, and had some appetite; retraction of the head was more marked, with opisthotonos. I put a blister behind the mastoids, with counter-irritation all along the spine; in addition to the ice-bag on his head, I had a hog's bladder filled with ice applied to the back of his head and neck. This character of treatment was kept up for the next week with a few other remedies, as indicated by symptoms, when convalescence began to be established. From the ninth to the twelfth day we dispensed with the ice and opium, and put him on iodide of potassium; he seemed to be practically out of danger — wanted to get up and put on his clothes and go play with his little twin brother. I will say here, that after the first three days his temperature did not exceed 100° F., nor pulse 90.

His diet consisted of milk, eggs, beef extract, and fruits — oranges, bananas, and apples — which he had a good relish for. His strength was such that he could have gotten up and gone about. His sight, hearing, taste, and smell were normal. On the thirteenth day the boy relapsed from some unknown cause (probably from over-exertion or having eaten something that disagreed with him, probably both) with an entirely different train of symptoms; the pain was in his extremities, mainly in his feet and ankles and hands and wrists and hips; his head did not draw back, did not have opisthotonos as in the first attack. The ice and opium were resumed, which had a charming effect in controlling the pain. This case went on at such length and with such a variety of symptoms (too numerous to describe). until about the seventh week, when he got so low that he could not speak nor move himself in the bed, nor could he swallow to do any good. Temperature normal or a little above, with pulse ranging from 130 to 160, and very weak; it looked like he could not live when his pulse reached 160, which was about the fifty-second day of the disease. We had given all the heart stimulants we thought would help except strychnia; on this day (the fifty-second of the disease) I gave him nitrate of strychnia

$\frac{1}{60}$ of a grain every four hours and all the whisky we could get into him, together with $\frac{1}{12}$ grain of morphia every four hours. We gave him rectal alimentation at this time. The next day he was a little better, pulse 154, some stronger.

He began to improve until he was well on the road to recovery. By the sixty-fifth day was taking nourishment by the mouth with relish in sufficient quantity, could turn himself over in the bed without help, had good use of his faculties. But, alas! about 1 o'clock A. M. on the sixty-fifth day he was taken with convulsions, followed by coma and death at 4 A. M. on the sixty-sixth day of the disease.

DISCUSSION.

Dr. J. B. MARVIN, Louisville: I open the discussion with considerable embarrassment, feeling that it is a subject that I know very little about, and concerning which I can hope to tell you very little that you do not already know. I was so unfortunate as to miss hearing the first papers, so I can not traverse the ground covered by those speakers. Just a thought or two bearing on my individual experience with the trouble that I am extremely anxious never to see again, and I suppose you will shake hands with me in the hope that we may never meet a case of this trouble again. Regarding the cause of it, I have done a good deal of reading and thinking, and while the bacteriologists all seem to be a unit in ascribing to the diplococcus intracellularis pathogenic properties, the question that has bothered me has been this: How could this organism find entrance to the cerebral and spinal membranes? I think your experience will bear me out in this, that recently, anyhow, the cases of spotted fever have generally followed in the wake of influenzal troubles, and I believe that the point of entrance is very frequently through the nasal passages. Now, in the nasal secretion as well as in the buccal secretion of apparently healthy people we can quite frequently find a micrococcus almost if not quite identical with this micro-organism. That seems to be a common local habitat, and if, as some claim, this micrococcus is simply an abortive form of the pneumococcus, which commonly resides in those secretions, you can readily see in what peril a man may be if he has some depressing

disease, such as the grippe, which simply lets the bars down to the entrance of the organism upon these structures.

Another point is the great difference in the severity of different cases. Why, we can only stand dumfounded, helpless, and hopeless before a case stricken down with such suddenness and severity, and dying in a few hours. There is a case I know of, that occurred only a few days ago, in which the patient died within a few hours. Often death occurs so suddenly that we have no way of knowing what the disease is, except by inference. Possibly on autopsy no changes would be found sufficient to justify you in saying that it was a case of cerebro-spinal meningitis. I think in this outbreak the majority of cases have not been of that type, but of a mild grade. The reports from other cities and places would indicate that the mortality has not been nearly so high as I thought before I saw the statistics. Now, taking the average case, such as we have here and such as I have seen most frequently, one of the most puzzling points is the question of diagnosis. Remembering what I said at the outset about influenza, or grippe, I believe quite commonly these cases would be diagnosticated as grippe; headache, backache, legache, etc., are all characteristic of grippe. The first case we had in Louisville, in this outbreak, that I saw, was diagnosticated as grippe and treated as grippe for two or three days. I believe the average cases you see, if grippe were prevailing, would puzzle you. Of course, in a little while the symptoms usually clear up, and the physician who has his eyes open and makes any examinations would readily make a diagnosis.

Dr. JOHN A. LEWIS, Georgetown: In view of the fact that the lower portion of our State of Kentucky has passed through an epidemic of this malady, I think that our discussion of the subject is both opportune and important. I feel that the gentlemen who have preceded me have left nothing for the gleaner, for the reaper has done his work and done it well. The gentlemen have treated the subject as well and as learnedly as could be. And they have been in the midst of this pestilence that walketh in darkness and destroyeth by noonday. And yet, gentlemen, when we come to stand before one of these cases, we shall still be as helpless as the child in the cradle. We have reiterated and gone over the etiology and the symptoms and the diagnosis, so that the recognition of the disease is plain and there can be no doubt about it. We do not have to puncture the spinal column as a rule for the diagnosis of this disease.

The vomiting, fever, headache, hyperesthesia, usually make the diagnosis easy, so that we can almost always diagnosticate the case at once. I thank the gentlemen for this discussion, to which I only wish I could add something, so that when I go back home and when my people ask me, when a case of spotted fever is announced, "What can I do to prevent it?" I need not feel so helpless as I must confess to you I am at the present time. The people look to us as the guardians of their health. Now, let us pitch our tents in front of this deadly enemy, and do not let us retire until we have stormed its citadel. Do not let us stop until we can offer these patients some hope of recovery. Any disease, gentlemen, in which the mortality is from 50 to 75 per cent, strikes fear to the heart of the people. It is worse than being fired on by the Spaniards with the Mauser rifle. Any disease that may make a man ready for the undertaker in twenty-four hours is fearful. The treatment with opium, and blisters, and bromides, and morphia, and so on, perhaps does something, but I doubt it, gentlemen. The disease is an inflammation of the cerebro-spinal meninges. Whether the microbe is the cause or not, we know that he gets there and we have the inflammation. When there is suppuration in the citadel of the brain and in the bony canal of the spinal column, we are certainly treating an alarming disease. I have been looking for the surgeon to say to treat it as an inflammation any where else, open the skull and wash out the brain, and if necessary put a drainage-tube from the top of the head to the tip of the coccyx. But I am not going to do it myself. I have been called upon to treat these cases often, but I have no experience except what these gentlemen have given us. The only suggestion I would make is the use of blood-letting, say to the amount of a pint, with the subsequent introduction of the normal solution of salt.

Dr. Archibald Dixon, Henderson: I do not think we know enough about the etiology of meningitis to discuss that point at all, but I would like to say a few things in regard to the treatment, which I think is the most important of all. The diagnosis of cerebro-spinal meningitis is very simple. If you ever see a case of the disease you will always know it when you see it again. I believe in the fulminant or malignant type of the disease you might just as well try to stop a cyclone as to stop the disease. The only thing you can do is to give morphin to relieve the pain. I had an experience at Henderson with the first case of meningitis we had there, and later with six other cases. Three of these cases died, one right after the

other. From thirty-six to forty-eight hours was the limit. The first case was a man who came from Webster County on a wagon load of tobacco, and became very much chilled. He went to bed. When I saw him he was blind, he had right divergent strabismus, he was absolutely comatose, knew nothing, and the only thing I could do was to relieve his pain with morphine. He died in about forty-eight hours. The second case was a young lady school teacher who was taken sick about midnight with headache, backache, and pains all over. In three hours she was comatose, in six hours blind, and in fourteen hours she was dead. In this case we had the spots. In the first case the spots were about as big as a millet seed and the color of a strawberry. The third case was in a child taken sick early in the morning, became blind, with the head retracted, opisthotonos, and was dead before twelve that night. I had four other cases, two in young ladies and another in a child about three years old, and one in a child about eight years old. Those cases recovered. I treated them with hot baths and Crede's silver inunctions over the spine. And I believe hot baths, opium, and the use of this inunction is the best treatment we have for this disease. Two of the cases I have just mentioned I believe were malignant cases. They knew nothing for thirty-eight hours, and yet I believe the treatment saved their lives. One of them is now completely paralyzed in the right arm and can barely walk, although it is ten or twelve weeks since the case was discharged. The little girl three years old was sick six or eight weeks, and has recovered entirely without any symptom of cerebral trouble. Her mind is as bright as ever. I believe the main thing in these cases is the application of heat by baths and hot applications to the spine, keeping down the pain with opium, and especially the application of Crede's modified ointment of silver, which I think is a 25 per cent ointment of silver.

Dr. William Bailey, Louisville: As chairman of the committee to select subjects, I did not have the privilege of making a report, but now I do say, and I think I ought to apologize some for proposing a subject of so difficult solution. We have spent two hours on this now. I selected it on account of its importance, on account of the fact that we know so little about it, hoping that from the districts where it prevailed we might get something that would be of practical service to us, and yet I am free to acknowledge that at this hour I still dread that disease as much as ever, and there is none that I dread more. There is no disease, I think, that comes to us in which the doctor is

more helpless than in this. In regard to the etiology, I think the consensus of opinion of those who are prepared to judge is that the germ discovered and described by Weichselbaum is the specific germ responsible for this disease. The difficulty of its entrance has been mentioned. I myself believe that the most ready method by which the germ can reach the membranes of the brain is through the nasal or air-passages. I recognize it as being difficult, and yet possible, and this will explain also why this disease, that is a contagious one, is not more contagious than it is. The animal, wild as he may be, is caged so that it is difficult for him to get in, and fortunately very difficult for him to get out. If we had the germs elsewhere than in the closed cavity of the brain and the spinal column, I apprehend that there would be no question as to the communicability of this disease. But I am unwilling to be recorded as believing that any disease propagated and dependent upon a specific germ is not a contagious disease. At one time I resisted the idea of contagion in very many diseases, until finally, by the overwhelming power of the facts deduced in regard to the germ theory of disease, I yielded, and I now believe that every specific disease due to a specific germ is contagious, that one case depends upon another in the same way. I believe this is a specific disease due to a specific germ, and that it is a contagious disease. The difficulty of the germ getting out is the safety of the community. In regard to the management, I hope the time will come when this disease will be successfully combated by means of serum-therapy. Referring to the case reported treated by the anti-streptococcus serum leads me to make this remark; the poisons or toxines of any germ are not combated by any toxine except of that germ. I will illustrate it by asking your attention to the successful treatment of diphtheria, in the first few days only, by the antitoxine of diphtheria, before other germs are operating. And if any thing is to be done for diphtheria by antitoxine, it must be while the germ of diphtheria alone is operating, because the antitoxine of diphtheria is not curative for the toxines of mixed infection. I hope the time will come when an antitoxine of the germ of meningitis will be developed that will be as successful as is the antitoxine of diphtheria. And inasmuch as the streptococcus antitoxine is not curative for the infection by any other micro-organism, so I do not believe it is good for any thing except the toxine produced by the germ that produces that condition.

Dr. W. O. Jenkins, Newport: Much has been said here and said well. The disease has been described in all its variations, and they

are many. Therapeutics have been gone into, and yet we are where we began. There is really no settled therapeutics or remedy that is active and serviceable in this disease. The streptococcus serum was hailed with delight as being the thing, and, while it is good, it has not proven the success we anticipated. Opium has been hailed as the sheet-anchor, and is probably the closest approach to it we have yet found. A late writer on the Continent, in Germany, I think, has suggested the use of the soluble citrate of silver in these cases. He reports five cases with a percentage of 80 per cent cures from the use of the ointment, one ounce well rubbed in along the spine every second or third day. I tried this in one case lately, but unfortunately my patient only got one rubbing—he was dead the next day. I do not know whether it was the patient's mistake or whether it was mine. The author seems to have great confidence in it. Possibly it is a new idea that may help some of our searchers after the truth. I received one idea in the diagnosis of the disease. The gentleman suggested sitting the patient on the bedside and endeavoring to elevate the heel so as to bring the leg out to a straight line. He says it is impossible to bring the leg into a straight line with the patient in that position in this disease, and claims that this sign is not missing in 5 per cent of cases in cerebro-spinal meningitis, while it is almost never found in healthy adults. I have not tried it. I enjoyed the papers because we have met with a fair amount of this disease in Newport. During this part of the year I do not suppose less than 25 cases have occurred, and this morning I saw an infant that undoubtedly has the disease. It was hearty and apparently well yesterday, had never been taken out of the house, never exposed in any way, was nursing a good healthy mother, and yet in the middle of the night it took sick with pain, and undoubtedly had the indications of the disease this morning at six o'clock. That child was not exposed to any germ disease in any way. There had been no sickness in the house. The surroundings were healthy, no tuberculosis, and I should like to know where that suckling infant got the disease.

Dr. F. J. Yager, Campbellsburg: I just want to ask a question or two. I am exceedingly interested in these discussions. I have had some cases of that trouble. Everybody that I consulted with who are treating these cases said, "they died," and every case I had, or thought I had, died. Now I want to ask these old physicians, these practitioners, some questions in relation to this malignant, fearful, and deadly disease. The question I want to ask is, Suppose that

you had had your patients thoroughly under the influence, or bring them under the influence of morphia just as soon as you can, with all these other manipulations, and suppose you put them under the influence of calomel. You know the influence of calomel. There is no one among us who has ever killed anybody with calomel, but this disease will kill our patients. Do not disregard any of your other work, but carry it on with all the power and force with which you have been carrying it. These doctors show that they were vigilant, watchful, and penetrating. But did they succeed? No. Now, we have here a malignant form of trouble, and we know the patient will die, no difference how great or strong or noble he is. Suppose you bring him under mercury. You know what calomel is, that it is an antiseptic; and suppose you keep him under the influence of that. We know the patient will in all probability die anyhow, but we might try this. And then bring in your sulphate of quinine. You know you never killed anybody with quinine, and you know that quinine is a powerful remedy. I listened to your treatment; I was interested in it all, and I was delighted with it all. And now we will bring in the bromide of potassium. We know its detergent nature and its influence on the brain. We have all tried it. At the same time we may keep up all the other things, for there is nothing contradictory in the treatment. In addition to this, if we have some of the protracted forms we must keep the functions all alive, watch the heart, use digitalis, if you please, and watch the strength of the lungs. I do believe, sir, if I had another case I would try as a foundation the influence of these remedies, which are solid as a rock in our profession. In cholera, years ago, I tried every thing they put up, but I derived most benefit from these old remedies.

Dr. J. W. Irwin, Louisville: The symptoms of spinal meningitis are variable. No two observers seem to have taken the same course in this disease, in describing and following up its etiology, its pathological anatomy, or its mode of entrance into the human body. We have come here, a great many, disturbed, knowing that an epidemic so serious as the one prevailing is upon us. The earliest and best reports we get of this disease were given us by Vieusseux, 1805, although as early as the second century the disease was referred to. Vieusseux described an epidemic prevailing at that time in Geneva, Italy, France, and Hungary, and various other European cities and countries. The disease reached this country in 1806, in Medfield, Mass., and remained until 1816 in various forms. It was looked

upon then as owing to some meteoric condition, it being believed that the influence of the stars or something had brought a curse upon the country. It disappeared in 1816, and reappeared in 1820–23 in this country. It was seen in 1811 in the army in Vermont; it was seen in Pennsylvania in a small village of 6,000 inhabitants, Carbondale, where 400 people perished of that disease. And so the disease has spread to the eastern and western part of our country, and to the north and south. We find it on the water courses and on the brows of the mountains; in low localities, in malarial countries, and where there is no malaria at all. It is not a respecter of any age or nationality. The young usually die, and the old over fifty usually die. Between forty and fifty the mortality is very high. Various observers have given various reports of this disease, and they find the average mortality is from 60 to 80 per cent. It has been as low as 25 and as high as 90 per cent in some countries. In Sweden 4,000 perished in one epidemic. The disease became domesticated through Europe from 1872 to 1892. In this country we find it has been domesticated, and 2,575 cases died from cerebro-spinal meningitis in the city of Philadelphia alone. In 1891 we find the fewest deaths recorded, numbering only 23 from cerebro-spinal meningitis.

Dr. Andrew Sargent, Hopkinsville: I feel that I have no apology to make for not offering you some definite information on this disease. The sum and substance of what we have heard is the sum and substance of what we do not know. And if we would be honest with ourselves and with the public, and when we do not know would say we do not know, I think we would discard much that now confuses us and the public, and would be in a better condition to know more about this malady. Like others in Southwestern Kentucky, I have had my trouble with it. I have been very much edified by Dr. Bailey, who says that the germ easily finds entrance to the system and does not easily find exit. Therefore the more cases, the safer to the people. Is not that an illogical conclusion? I was sorry to hear an authoritative statement from the State Board of Health to the effect that this disease is slightly contagious, if contagious at all. I had rather they had come out squarely and said this is not a contagious disease. Generally it does not follow the lines of travel over this country. The disease has been found first and chiefly over the sparsely settled districts of Kentucky, where the roads have been bad and the means of communication between the people have been poor. I do not believe we can hold that it is contagious or communicable.

As to treatment, I can not offer any thing positive to you, but I would treat it symptomatically. The disease appears in different forms. I believe if you had high fever, you would be justified in using antipyretics, the best of which is quinine. If pain is prominent, use opium. For emesis I would put blisters over the stomach, and give calomel, ipecac, and soda in small, often-repeated doses. I believe blistering does good. It prevents the patient from lying on the spine and back of the head. I believe blood-letting in sthenic cases would be beneficial. I believe with the gentleman who has just been on the floor that calomel would be good if you had time, but often in the fulminant cases you have not time for any thing.

Dr. CHERRY, Morgantown: I have had an experience of about twenty cases. I have seen no two cases taken sick exactly alike. I have seen some taken sick with a chill, others with a drawing and contraction of the muscles of the leg, others with a drawing of the testicles, and in various ways. As to treatment, I think opium is the best remedy. We should keep the patient quiet. No one grain of morphia will be sufficient; it will take two grains to keep them quiet. Hot applications to the body will invite the blood to the capillaries. As to Crede's ointment, I have had some experience with it, but I know of no virtue in it. I have used it in several cases. I know nothing else to say in regard to these cases.

Dr. ARCHIBALD DIXON, Henderson: I do not agree with Dr. Bailey that the micrococcus Weichselbaum is the cause of cerebro-spinal meningitis, nor do I believe that the disease is any more contagious than malaria.

Dr. H. C. SHARP: We have had a large number of deaths reported in a town of about 600, and therefore the cases must have suffered very much from overcrowding and ill ventilation. I had a case develop with a chill Sunday and die the following Tuesday. There were two boys constantly in attendance upon the patient, one during the day and the other during the night. The patient died about three o'clock on Tuesday, and simultaneously on Friday noon his two attendants consulted me for the relief of intense pain in the head. I feared, of course, that we would have two more cases of meningitis on our hands. I prescribed a calomel purge, followed by a saline, and gave a capsule each containing

℞ Acetanilid } āā.....grs. iiss
Sodii bicarb. }
Camphor monobrom. } āā.....gr. i,
Caffeine citrate,..... }

taking one every three hours. Each patient recovered from the pain in his head after taking four capsules. Of course I do not say that these were cases of meningitis, but I have adopted that prescription, and have given it to perhaps twenty patients a day for some three weeks following those cases.

Dr. J. G. Brooks, Paducah: I do not propose to discuss any more in reference to the etiology and symptoms of the disease. Somebody said he thought the diagnosis could be made by anyone who has seen a single case. It is easy, in my judgment, to diagnosticate cerebro-spinal meningitis as a rule. I never had much experience with this disease until this year. In our part of the State, the southwestern part, the disease prevailed, especially in our city. We had meetings of the local society, which all the doctors would attend, and we discussed the subject quite thoroughly. One gentleman who belongs to the society claims to have had very extensive experience with this disease years ago, and he has more than once in our district society and other meetings discussed the subject, in which he seems to have taken a great interest, claiming to have very great success with the hypodermatic injection of bichloride of mercury. He says the mercurialization is much more marked, and if you can get it soon enough you will have a fair percentage of recoveries. Acting upon that, the major portion of the members in our city commenced the use of mercury, some by hypodermatic injection and others by the use of triturates and powders until mercurialization was obtained. For the extreme restlessness, we found very satisfactory effects follow the subcutaneous injection of hyoscyamine. Cold was applied to the head, and sometimes heat to the extremities was used. With the application of cold to the head, the early introduction of mercurialization, and quieting the patient with hyoscyamine, we had good results.

Dr. Gossett: I would like to mention three cases, two of which I saw in consultation. One of them was in a child seven years old, the daughter of a physician. Those cases seemed to support the suggestion made by Dr. Marvin. One of the cases, that of the little girl seven years old, was diagnosticated as grippe-pneumonia. The symptoms of grippe were more prominent than those of pneumonia. It resulted soon in cerebro-spinal meningitis. The second case was in an adult, and was diagnosticated as rheumatic grippe, the patient having been attacked with muscular rheumatic pains from the tips of his toes to the top of his head. In about thirty-six hours it terminated in cerebro-spinal meningitis. The first case recovered in nine

or ten weeks, the second case died about the tenth or thirteenth day. Now, in reference to the treatment. It seems that the gentlemen have discussed the results of the causes. As Dr. Bailey has said, we are after an animal, and we are satisfied that animal has gone into his hole, and, so to speak, has drawn his hole in after him. Dr. Lewis suggests that we should pitch our tents in front of the enemy and not move until we have made a movement toward victory. Now, in view of the fact that we have a theory that there is an animal there, and it is claimed that we have a remedy in antitoxine, why should we not use that method of treatment? If it is a fact that the cause of cerebro-spinal meningitis is a microbe, why not fight him on that line, and follow the suggestion of the administration of bichloride of mercury in sufficient quantities to secure an antiseptic effect? Or, why not seek a remedy along that line in order to remove the cause of the disease, the treatment of which is so difficult with the methods we now possess. The anodynes and cold seem to be the best treatment of the results, but we should be more concerned with the discovery and removal of the cause of the disease.

Dr. L. L. Solomon, Louisville: I wish to take issue with the statement made by Dr. Bailey concerning the therapeutic value of anti-streptococcus serum in cerebro-spinal meningitis. It is not my purpose to defend this serum in the disease in question, but to refer more especially to a difference between antagonism in disease and antitoxines. The antitoxin of diphtheria is used altogether on a different principle, as I understand it, from that of the streptococcus serum in cerebro-spinal meningitis. In the first instance we have an agent that makes the soil non-fertile for the development of the diphtheria bacillus; in the second place we have a substance which is chemically antagonistic to the toxines of cerebro-spinal meningitis. The authorities are agreed to-day upon this point, namely, antitoxin in diphtheria or antitoxine in any one of the specific diseases acts in one of two or possibly three ways. Either the antitoxine prevents the entrance of the toxine into the soil, or the antitoxine acts as antidote to the germ, or thirdly, the antitoxine acts antidotal to the toxine. Now, in reference to anti-streptococcus serum, the idea is altogether a different one. We have an antagonism such as exists between one of the malignant growths and the serum from the streptococcus erysipelatus. It was stated some years ago that the germ of Fehleisen has an antidotal action in this way, and Dr. Coley and some others of New York City have been applying the statement in

practice. This treatment has been of avail. While it is not known what the cause of malignant growths is, it is to be presumed that it is a different cause that brings about facial erysipelas. We can not doubt, however, the therapeutic value of this serum in certain cases of malignant tumors, and I maintain that we have here an antagonism to the disease such as can exist between the anti-streptococcus serum and cerebro-spinal meningitis.

Dr. R. M. JONES, Louisville: I have had four cases. The first died; the second died; and the third one died, and I came to the conclusion that when I got the fourth case I would do something, and that it would not die if I could help it. There is a difference between cerebro-spinal meningitis and meningitis pure and simple. I think all cases of meningitis pure and simple, mostly found in childhood, are secondary, most frequently due to profound malarial intoxication, and again to abscess of the middle ear.

I began the treatment of my fourth case, a child two years of age, on the grounds that it was due to malarial poison or secondary to it. I used the following prescription:

℞ Kryofin.....grs. viii;
Potassii bromid .....gr. ss;
Febrilin.....fl. ʒ i.

M. Sig.: Teaspoonful every hour until all is taken.

Thus the patient received two grains of febrilin every hour, and sixteen grains in eight hours. I expected the kryofin to reduce temperature. The effects of the other two you well know. The child had the peculiar outcry, paralysis of the left side following the spasmodic conditions, pupils unevenly dilated, and coma. That in most cases ends the case. The pupils did not respond to light. Opisthotonos in full sense was not present, but the tendency to throw the head back and from side to side was well marked. After the eight doses were taken I dropped the bromid and gave one grain of kryofin and one dram of febrilin every four hours for forty-eight hours, and then every six hours for the next forty-eight hours. The child is now perfectly well, without any bad results whatever. A number of my patients were from low, damp places, and I would treat all these cases as if due to a certain extent to malarial poison. Whether there is any thing in the treatment or not, suffice it to say the child got well, and I am satisfied it had the same disease of which the others died.

Dr. C. C. LEWIS, Stamping Ground: I have been impressed with one idea in the matter of bromide of sodium, bromide of potassium,

and even in the matter of morphine, which is perhaps the only thing left us, so that we can make the family believe we are doing something for the little sufferer. I have been surprised at the small doses of morphine mentioned. The treatment mentioned reminds me of the fact that the most pungent criticism usually comes from the man who has least knowledge of the thing he criticises. We have spent the whole afternoon discussing cerebro-spinal meningitis, and we are occupying the time with a subject that we know but little about, and I am afraid it will be a long time before we do know any thing about it. One gentleman has said that no man could fail to make a diagnosis. That has not been my experience, except when we are in close touch with an epidemic. When we are on the lookout for it we scarcely ever miss it, but when a child comes in from playing and complains of a pain in the finger or toe as the only symptom of cerebro-spinal meningitis, you can not tell me that the disease is easily recognized. There are so many things that may cause pain in the fingers or toes that our attention is diverted. My experience, as far as this disease is concerned, has been a very sad one. All the cases I have seen are now in the grave. It has been my experience that there are two things in the disease we can not overcome, that is, constipation and death.

Dr. D. O. Hancock, Henderson: My impression is that we have learned more of the disease than has been suggested by some in the discussion. It is almost impossible to get at the salient feature of the disease, which is located in the cerebral membranes. We should not therefore give up and say we do not know any thing about the disease. We at least know that it is a constitutional disease, a toxemia, almost parallel with pneumonia. We can manage pneumonia, but we can not manage cerebro-spinal meningitis so well. The serum treatment offers something to hope for. At least we may hope for much in the way of better results in the future.

Dr. J. D. Maddox, Rockport: I wish to say in the outset that I am not a champion of the use of anti-streptococcus serum in the treatment of cerebro-spinal meningitis. I have heard of its being used in but three cases. The first two were published by Dr. McNabb in the New York Medical Journal of February 25th of this year, to which my attention has been called, and which is responsible for my having used it in the case referred to. That, together with the fact of the high mortality rate and the generally conceded ignorance of the profession of the treatment of cerebro-spinal meningitis, led me to adopt that method of treatment. The patient under my care was as rapidly

approaching dissolution as it is possible to conceive. The report of Dr. McNabb's cases coming into my hands, the apparent good results in his cases seemed to give me a ray of hope, and Dr. Jackson and I readily agreed in the use of it. Did it have a good effect? I think there can be no question. At least we all agreed that the first dose did have a very pronounced beneficial effect. The effect might possibly have been better if the doses had been given closer together. We had but three doses this side of Detroit that I knew of. I was informed that it was not even on deposit in Louisville. After the first dose I telegraphed immediately for a supply. Then the question arose whether to give the two remaining doses close together or to stretch them out until the amount telegraphed for should arrive. As soon as the good effects were being lost appreciably we gave another dose. The fourth dose, given some thirty-odd hours after the third dose, did certainly do some good in steadying the pulse. After the fourth dose the pulse steadied down to about 80 or 85, and remained so for several hours. One of Dr. McNabb's cases recovered, and the other one he believed would have recovered except for a hemorrhage of the brain; so that his results certainly give us something to hope for. The following are Dr. McNabb's conclusions: "1. The anti-streptococcus serum has a decided stimulant effect on the nervous centers in meningotetic coma, but the same results might follow a warm saline hypodermoclysis. 2. It probably increases phagocytosis, and in this way has some antidotal effect on the diplococcus intracellularis. 3. It probably prevents purulent infection of the exudate, and thus lessens the danger in all cases in which the patients survive the first three or four days. 4. From my observation of these cases I am quite hopeful that an anti-streptococcus intracellularis meningitidis serum can be produced which will have a decided effect in controlling the trouble, toxemia, of meningitis, and that the associated effect of anti-streptococcus serum after the second day will assist in preventing streptococcic infection exudate. 5. I am well aware of the fact that the improvement which I saw in these cases may have been a coincidence and not due to the use of the serum, but if it was, it was entirely unlike any thing I have ever seen before in such cases. 6. I may state that in Case 1 the patient would have improved faster if the serum injections had been continued daily for several days longer, and if I should meet with another case like Case 2, I would give from 40 to 60 c.c. of the serum in the first 36 hours."

Dr. Royster: I just wish to add that at the suggestion of my friend I used Crede's silver ointment in my case.

CHOLELITHIASIS.

By R. C. Falconer, M. D.
Lexington, Ky.

This subject I take to be one of the most interesting and important in the purview of medicine and surgery. Though not a disease of modern classification (rather modern antiquity), it would seem at the present time more common because better understood and more frequently recognized as such than earlier in medical history.

Classification of disease is a mark of medical progress, and in the division of disease as a genus into its various species, cholelithiasis has taken its place as a distinct disease among its kind and stands out in the foreground.

We are often asked by the laity why appendicitis is so common nowadays, when we used to hear little or nothing about it, as if a disease had originated *de novo*. The fact is, according to reason and the nature of things, appendicitis has prevailed to a greater or less extent from time immemorial, but unrecognized as such, "inflammation of the bowels" being the nearest terminology to a description of the real *modus et locus lœsionis*, and that might have meant any one of the several diseases now distinct from each other in location, pathology, and treatment, *e. g.*, peritonitis, colitis, ileo-colitis, etc.

What has just been said of the intestines and appendix is applicable to the liver and its appendages. In reviewing the history of diseases of the gall-bladder, we find that Keulmann, in 1655, was the first to make observation of biliary calculi, but the relation between them and the symptoms they produced was not established until about a half century ago through the

researches of Jacconneau Dufresne. The pioneer work in the field of chemical analysis of gall-stones was begun by Galeati; later Joucroy, Thenard, Portal Bocillard, Bouisson, and Harley worked in the same direction and found cholesterin to be the predominant constituent of biliary calculi.

We now pass to the etiology, of which the prime factor is gastro-duodenal catarrh; this constitutes also the diathesis upon which the disease depends. Among the causes which produce a catarrhal condition of the chylo-poietic system are atony of the secretory and absorptive glands, brought about by hyperstimulation, or, reversely, insufficient activity from overeating or prolonged low diet, respectively. Alcohol is a potent factor in producing gastro-intestinal catarrh and the so-called "bilious" condition, besides causing obesity, which predisposes to the formation of gall-stones. Imperfect physiological chemistry or faulty metabolism is another factor of some importance. According to some writers on this subject, bacteria have an etiological relation to the disease under consideration.

In connection with this part of the subject I am reminded that there would seem to be a sort of relation between the appendix vermiformis and gastro-intestinal catarrh; the appendix, being a portion of the intestine and participating in the catarrhal process, becomes congested and swollen, its caliber narrowed, and it is not altogether unlikely that the apparently extraneous matter found in the appendix is occasionally a concretion formed therein much after the manner of a biliary calculus, and deserving the name of appendolith, the nucleus of which may be a product of the catarrhal condition, or it may be a fecal concretion. (This has no pretension to medical dogma, though I think the theory is entitled to some consideration.)

Clinical History. Cholelithiasis is a disease of adult life, and occurs at any age between twenty-one and seventy years. It is exceptional in infancy, a few cases being recorded, and rare among the negro race. According to Cyr, of Vichy, the age of maximum liability is from twenty to forty years. Bartholow

places it at fifty. The essayist saw a case demonstrated post-mortem in a lady seventy years of age, who had been treated for cancer of the stomach, but autopsy showed no malignant disease.

Females are more subject to gall-stones than the male sex, the proportion broadly estimated being four to one. The preponderance among women is due to their habits of life, mode of dress, and peculiar organization. In female victims of gall-stones paroxysms often occur or recur at or about the menstrual periods, and at this time occasionally take a critical turn. Of ten cases that I recall, six were males and four female; ages ranged from twenty-six to seventy years; average age, thirty-nine years. Four of the male subjects weighed about two hundred pounds respectively, with a height of six feet.

Gall-stones are very common in large, fleshy persons. I know a lady who has gall-stone paroxysms, more or less severe, whenever she begins to take on additional flesh.

The seasons, so far as they control work, exercise, quality and quantity of diet, sports, etc., may influence the formation of gall-stones and the occurrence of paroxysms, but I take it they do not constitute an important factor. Climate also plays only a minor rôle in the etiology of cholelithiasis, though the disease is said by some writers to be less common in temperate climates than in the tropics; in this connection the consumption of much meat, especially fat, being considered as belonging to tropical countries. Gall-stones may remain quiescent until a paroxysm is excited by violent exercise, jolting, or the drinking of alcoholic beverages.

Diagnosis. The syndrome of gall-stones is composed of pain, jaundice, presence of calculi in the stools, besides the local symptoms and appearance of the stools indicating the absence of bile-pigment. The two cardinal symptoms are pain and calculi detected in the alvine discharges. Jaundice, though a common symptom and a feature more or less pronounced in the majority of instances, is usually absent when the cystic duct alone is occluded, the ductus communis choledochus being free; nor do we

always find calculi in the feces, as they are sometimes too large to pass through the ducts into the intestinal canal. We ought to look for them, not only as soon as the bowels act after paroxysms, but even repeatedly several days afterward, and the best method of searching for them is to wash the alvine evacuations through a filter or sieve. By doing this we will often find calculi or gritty, sandy bile.

As to the character of pain—usually the first symptom and intimation of the disease—it is paroxysmal and severe, oftentimes of the most agonizing kind, starting at the epigastrium, thence radiating into the right hypochondriac and lumbar regions, frequently darting into the right shoulder or downward, as I have observed, into the abdomen and even the groin, simulating the pain of nephritic gravel. Palpation over the gall-bladder and liver border reveals tenderness and elicits pain, which remains several days or more after the paroxysms have ceased.

Cholecystectasia, distension or dilatation of the gall-bladder, may be detected on palpation if the cystic duct is occluded, or the bladder in a spasmodic state may be felt, but this is not usually an easy matter, owing to the hard and tense rectus muscle. The liver is sometimes congested and enlarged, and can be outlined as such. The pain or tenderness may fix itself at one point or shift about over the region of the gall-bladder or liver. The entire abdomen is often tender and tympanitic from diminished or suppressed secretion of bile, if not from peritonitis. Directly or shortly after the paroxysms the temperature rises, ranging from 99.5° F. to 101.2° F.; the pulse is normal, quickened, or even abnormally slow. Chilly sensations or distinct chills are sometimes concomitant features of the attack; rigors, too, occur, but these sound a warning note and give to the case a more serious aspect.

I have purposely avoided using the word colic in connection with gall-stones, because it has no place in medical nomenclature except as applied to the colon, from which the word is derived. To speak correctly, there is only one kind of colic and that is

intestinal, or a spasm of the colon. (This is not my own observation, but I think the exception well taken.)

Nausea and vomiting frequently accompany the attacks, the vomitus being bilious or mucous; the absence of jaundice and bilious vomiting would indicate occlusion of the cystic duct. Constipation is usually present, although purging sometimes occurs from lack of bile as an intestinal antiseptic, or may be due to intestinal inflammation in connection with the disease under consideration.

The stools characteristic of biliary obstruction are of a whitish or grayish color, sometimes resembling putty in both appearance and consistence. Examination of the urine shows bile-pigment and lithic acid salts, especially if there is systemic absorption of bile, as in jaundice. Obstruction of the cystic duct does not necessarily cause bile to appear in the urine; the nitric acid test, however, ought to be made in all cases. The tongue is usually more or less coated white, sometimes red at the tip and edges, indicating gastro-intestinal derangement. The heart in some cases becomes exhausted from prolonged suffering, and, as a result of increased pulmonary arterial tension through irritation of the splanchnic nerves, mitral or tricuspid insufficiency is produced. Among the reflex phenomena are herpes zoster and epilepsy.

An important consideration in connection with this subject is the relation of gall-stones to malignant disease of the liver and biliary passages; they are often found together, demonstrated on the operating or post-mortem table, and the question of cause and effect naturally enough arises, whether gall-stones in cancer of the liver are primary and the exciting cause of the malignant disease, or a secondary product thereof. Frerichs found gall-stones in nine of eleven cases of cancer of these parts.

As to Composition of Choleliths. Cholesterin forms the bulk and is precipitated and crystallized by deficiency in bile salts, glycocholate and taurocholate of soda. Cholesterin, χολή (bile), στέαρ (hard), $C_{26}H_{44}O$ or $C_{25}H_{42}O$, chemically is a monatomic alcohol, a constituent of bile and a normal ingredient of nervous

tissue; also the fatty substance forming the acid principle of biliary calculi. It is a glittering white crystalline substance, soapy to the touch, crystallizing in fine needles and rhomboid plates. It is quite insoluble in water and in cold alcohol, but soluble in solutions of bile salts. It is levo-rotatory. (Gould.)

Biliary calculi vary in number, size, shape, and appearance. In number they range from one to several thousand, depending upon the course and treatment of the disease. A case is on record in which 7,802 calculi were found in the gall-bladder. Doctor G. D. Kelly, of Lexington, Ky., recently had a patient from whom 135 were removed by cholecystotomy; they varied in size from a millet seed to a sparrow's egg, were polyangular in shape, and of the consistence of soapstone. The size of gall-stones ranges from a millet seed to a hen's egg. Frerichs mentions a calculus five inches in length and four inches in circumference, but this belongs rather to the medical museum than to the everyday clinician's showcase. Biliary calculi take various shapes, globular, polyangular, ovoid, conical, etc., and often have facets caused by mutual friction. In appearance also they vary—white, yellow, brown, black, green, and mottled. I have seen them in appearance, at their early formative stage, resemble a yellow grain of corn. Inspissated bile will occasionally give rise to very much the same train of symptoms produced by regularly formed calculi, and can be observed in the feces as greenish lumps, probably embryonic calculi. The intestinal secretions deepen the color of gall-stones, and after becoming firmly organized they undergo a sort of petrification. It is a noteworthy fact that gall-stones are frequently found accidentally in operations during life and post-mortem, and often without having given rise to any special symptoms.

Prognosis. The outlook in the majority of cases of cholelithiasis is favorable *quoad vitam;* as to correcting the constitutional vice or diathesis, the cure is often difficult, and impossible without radical or operative treatment. Some cases run their course and finally cure themselves spontaneously, or recur after

a lapse of time; others are subjected to medical or surgical treatment and recover, while another class proves fatal from accidents or complications occurring in the course of the disease, such as laceration of the cholecyst or ducts, abscess of the liver or appendages, peritonitis, cancer of the liver, stomach, pancreas, etc. In examining the abdominal viscera with reference to gall-stones and malignant disease, the pancreas must not be overlooked, as it is oftentimes involved.

Treatment. As we are usually first called upon to treat the paroxysms of pain and acute symptoms, I shall invite your attention first to the treatment of these, then pass to the prophylactic or radical treatment.

For the relief of pain we must place our reliance upon morphin, atropin, and chloroform. Morphin acts better in combination with atropin, because the gall-bladder and ducts are composed partly of muscular fibers, and atropin relaxes these and tends to facilitate the dislodgment and passage of the concretion. Chloroform does likewise. Counter-irritation by means of turpentine stupes, mustard plaster or poultice, tincture of iodine or blister is often useful as an adjunct in relieving pain, or the application of dry or moist heat is beneficial.

Of the cholagogues, calomel, blue mass, podophyllum, etc., may be available, but I have found Epsom, Crab Orchard, and Carlsbad salts in drachm doses, frequently repeated, olive oil, and the concentrated Pluto of French Lick Springs (Indiana) to be more efficacious in stimulating the flow of bile and bringing about the expulsion of gall-stones than other remedies for the purpose. A sojourn at Carlsbad, Saratoga, or French Lick Springs will be beneficial.

In this connection I desire to mention and emphasize the therapeutic value of a course of water at the celebrated French Lick Springs, Indiana. There are several varieties of water at this place, but I refer especially to the spring called "Pluto." The systematic drinking of these waters, combined with the methodic exercise and diet, I have found in cases sent to these

springs to be decidedly efficacious in bringing about a cure, not only of the paroxysms of cholelithiasis, but of the condition of gastro-intestinal or duodenal catarrh, and it is to this that the treatment in most cases must be directed. The waters of French Lick Springs literally and actually flush the entire alimentary canal, wash out the stagnant mucus and catarrhal products, and promote nutrition and metabolic processes.

Copious injections high up into the bowel will also stimulate the flow of bile, but the bowel ought to be thoroughly emptied of fecal matter before this procedure is undertaken. The gall-bladder is stimulated secondarily from primary stimulation of the duodenum through its nervous mechanism, the impulse being transmitted to the gall-bladder, and it is in this way the olive oil and the various salts act. The bile salts also have a cholagogic effect, either directly or by substitution. In cases characterized by the absence of bile in the intestines, I have found pancrobilin, the liquid or extract, an excellent remedy. With reference to olive oil, it is best given in two or three, or, if necessary, smaller doses, till a pint is taken, as the stomach often rebels against a large quantity. It may be given by enema, but I think with less effect.

I only mention Durand's remedy (ether 3. and turpentine 2.) for dissolving the calculi. I have had no experience with it. His theory is assailable from the fact that the pain of gall-stones is usually produced by the stones migrating in the ducts, and even though the concretions were dissolved in the bladder, the remedy applied this way would in all probability fail, and it can not be applied to the ducts.

The diet during the paroxysmal period ought to be liquid and easily digested, sweet milk, or buttermilk, beef or mutton soups, etc. Alcohol is contra-indicated. Predigested foods are in order if necessary.

The concentrated Pluto of French Lick, if a cholagogue is indicated, is very effective, and can be obtained in any of the cities. Another procedure that has proven useful in my hands

is gastric lavage, which I have practiced during the paroxysmal stage and as a part of the inter-paroxysmal treatment. Flushing the stomach with hot water has seemed in several of my cases to control the paroxysms, probably by relaxing the congested membranes and its effect upon the sympathetic nerves.

Prophylactic Treatment. The diseased condition of the alimentary canal upon which cholelithiasis depends, namely, gastro-duodenal catarrh, must be treated by careful diet and suitable remedies. I have found the prophylactic treatment unsatisfactory, because the patients after recovering from the paroxysmal period did not execute the treatment as prescribed, and we often lose sight of them until the paroxysms return, which is usually the history of such cases. Patients do not seem to appreciate the importance of this treatment, or if they do, they neglect it to their own detriment. So much for the inter-paroxysmal or prophylactic treatment.

I shall now ask your further indulgence and attention to the surgery of the gall-bladder. Notwithstanding anti-paroxysmal and prophylactic treatment, a certain proportion of cases of gall-stones undergo changes and assume conditions which necessitate operative interference, the operation being selected to suit the state and requirements of each individual case. According to Doctor Joseph Eichberg, of Cincinnati, Ohio, whose contribution on diseases of the liver in Hare's System of Practical Therapeutics is invaluable, operation is indicated as follows:

"First: In cases having repeated attacks of biliary colic with rapid exhaustion of the patient.

"Second: When there is evidence of suppuration in the gall-bladder or its neighborhood set up by the gall-stones.

"Third: In cases with acute or perforative peritonitis starting in the region of the gall-bladder when there is a distinct history of gall-stones.

"Fourth: In obstructive jaundice when there is reason to think the common duct is occluded by gall-stones."

As bearing on the last indication, Courvoisier's sign is of value:

"A distended gall-bladder is not found in obstruction of the ductus choledochus from stone; if the gall-bladder is distended, then the obstruction is due to other causes, as cancer or stricture of the duct."

The operation most frequently performed for gall-stones is cholecystotomy, which consists in opening by incision the gall-bladder, which, being held well up into the abdominal incision by silk thread much like the urinary bladder in suprapubic cystotomy, is carefully emptied of the calculi with a spoon adapted to the purpose and by gently manipulating the bladder. The gall-bladder is finally stitched to the abdominal wall and drained. The ducts are next examined, and if there is no impaction the calculi can be carefully and gently manipulated into the bladder or intestine. If firm impaction is found in the common duct, choledochotomy or incising the ductus communis choledochus will necessarily follow, the stone or stones removed this way, and the incision closed.

Cholecystolithotripsy, or crushing gall-stones in the gall-bladder, and choledocholithotripsy, crushing gall-stones in the common duct, have been recommended, but the procedure, I take it, if followed at all, must be done very carefully. If, however, the impaction happens to be made up of inspissated bile in lieu of hard organized stones, it can be done more easily and safely.

Cholecystectomy, or excision of the gall-bladder, is reserved for cases characterized by extensive ulceration or malignant disease.

Cholecystenterostomy is another operation which belongs to the surgery of the gall-bladder, and is indicated when the common duct is occluded by stenosis, stricture, cancer, or if, in case of stone, it can not be removed with impunity.

CHARLATANISM.

By Ap Morgan Vance, M. D.
Louisville, Ky.

I should say the medical charlatan has existed since the earliest history of medicine, and has always flourished. The reason for this is very plain, and is aptly illustrated by the old anecdote of Dr. Abernathy and the quack, who was upbraided by the doctor for his charlatanism, but who justified himself by asking the doctor, of the thousand men who daily passed his office, how many he supposed were intelligent and of sound, well-balanced judgment; and upon being answered, probably one in the hundred, replied: "You may have those ten, but I will take the nine hundred and ninety fools for my patients, who for their folly deserve to be quacked upon."

In these progressive times one would suppose that people would learn enough to discriminate, especially when their health and many times their lives are in the balance. It would seem that people who were educated, and in other matters of life were very discreet and sensible, would not be the supporters of such fakirs; but this is not the case, for we all know that men distinguished, and often men in high places, are the most enthusiastic, giving their names under and their pictures over certificates of the wonderful cures made by the most outrageous nostrums—ministers, lawyers, congressmen, governors, and so on *ad nauseam.* These certificates are so numerous that they must be a great source of income to the daily papers, as well as the religious weeklies and monthly magazines, indicating in a very reliable way how much of the poor people's money goes without any return. We can feel sure that the expensive advertisements

would not appear unless it paid the advertisers. One curious thing I have noticed in these certificates of quacks' medicines is the complete disregard of the ordinary privacies of life. What would the people think of a regular physican who would go around telling that Mrs. So-and-So had been afflicted with a bad case of "whites" for years, and that he had cured her? Letters with the name and address of the writers, giving a detailed account of symptoms, are regularly published, the above being among the mildest expressions often seen.

The following quotation from a recent number of a weekly paper on this part of the subject I think rather to the point. I take it to be a parody on some other item on the pill habit. I do not endorse the style, but most decidedly do endorse the sentiments expressed in the editorial. It says in part:

"In a late number of a popular magazine I see portrayed, with all the skill of the expert illustrator, a beautiful young woman with her hair neatly braided down her back. She is arrayed in a nightgown which is a dream. Like the goddess in New York harbor, she holds aloft a lighted candle, and in the other hand — a pill. If the drawing is to scale, the pill is about the size of a baseball. The import of the picture is that the lissome beauty is about to swallow the baseball. Beneath the picture is the legend, as near as I can remember: 'My complexion is perfect because I take one of Billson's Bully Bilious Bombshell Boluses every night before retiring.'

"Now, while incidentally protesting against the tendency to realism in art on the part of the bilious Billson, I wish to call attention to some facts first brought to my notice by a prominent Eastern physician. He stated to me that all reputable practitioners lament the alarming increase of the pill and dope habit, and that those people who make a practice of irritating their systems with the thousand and one nostrums recommended by the illustrated magazines, family weeklies, and religious journals are paying heavy penalties in physical, mental, and moral decadence.

"These periodicals teem with warnings that we must at once lay in a stock of Jig Syrup, Early Prisers, Col. Carter's Little Lifter Pills, Dood's Farsaparilla, Rip'ems Tabarets, Pink Pills for Pale Plumbers, Liar's Sherry Pictorial, Dr. Fierce's Golden Medical Freelovery, etc., if we would have good complexions, sweet thoughts, and long life. Too many people believe this; the habit begins by a gentle dalliance with Lady Cagliostro's After-dinner Assuager, assured by all the stall-fed aristocracy of Europe; it grows and grows; two pills, three pills, a box; a change of treatment becomes necessary, and soon another change; the poor victim runs the entire gamut of nostrums, and, an almost total wreck, is obliged to seek a specialist.

"Without paying attention to the secular periodicals—which are known and expected, with a few exceptions, to be indifferent and entirely mercenary—let us look at the so-called religious press, which ought to be conducted upon a higher plane.

"Taking those which happen to be at hand, I find that the Outlook affects Terror's Seltzer Accipient; the Churchman, Dr. Mule's Nervine; the Christian Register, Acid Fulminate; the Christian Leader, Dr. Fierce. The Christian at Work works for Dr. Fierce and others; the Presbyterian pushes Prune Juice; the Christian Advocate apparently advocates Early Prisers and Rip'ems Tabarets. The Baptist Standard is boldly waved in favor of Dr. Gall's Windy Water Cure Self-Treatment, while the Examiner makes a favorable report upon Jig Syrup and Prunes. The Rev. Dr. Talmage's Christian Herald seems somewhat undecided, and gaily toots for Dood, Beat'em, Dr. Gall, and others. The Southern Pulpit not only holds out all these great gifts to mankind, but introduces 'a sure cure for petulance' in the person of Dr. Jingle (the name should sell the blessing, one would think), whose discovery is prayerfully recommended by seven clergymen, three of them D. D.'s.

"Not long since in a court of law Fig Juice was acknowledged to be innocent of figs. Those who take Prune Juice and

congratulate themselves that they are full of prunes are only so in a figurative sense, having really encompassed a drastic dose of aloes. Keeley graduates will do well to avoid the various 'tonics,' and those who do not care to acquire the morphine habit had better leave nervines, compounds, and other soothers to the editors of the journals which so persistently proffer them.

"As it seems, after all, to be with these gentry only the same old question of money, the religious titles given their papers being a cloak, I would suggest the formation of a trust; rates could then be raised, clerical certificates distributed upon an equitable plan, and expenses much reduced. As it would hardly do to call the association a trust, I would suggest the following title: 'The United Association of Quack, Fake, and Fraud Assisters, Unlimited.' Motto: 'Aloes, Alcohol, Opium, and Dough.'"

So much for the patent medicine charlatans, all of whom should be prosecuted for obtaining money under false pretenses.

The two great fads to which the superstitious and credulous people are now looking for miraculous relief are Christian Science and Osteopathy. These cults are headed by two of the greatest charlatans of any age, and have less basis in merit even than the patent medicine frauds, which have less than none.

The science (?) of osteopathy is evidently an outgrowth from the old cult of natural bone-setters, and has done more real harm and caused more suffering and more deaths than is ordinarily the case. This is due to the savage brutality to which patients are subjected. If a regular physician or surgeon was to subject a patient to the rough usage that the fool followers of these osteopaths daily go through, he would be mobbed or have to answer to the law for malpractice. It is simply beyond comprehension that people will submit to such treatment in these enlightened times, especially when they see that no good results.

I had a little patient, the son of a minister, who suffered with hip-disease, with abscess; after combating the superstitious and foolish interference of the parents and grandparents with

their patent medicines, dirty poultices, and so forth, I succeeded in getting the deformed limb straight, the abscess had healed, and the child was able to walk on a protective splint. Every thing looked bright for a good result. Much to my surprise they bundled him up and took him to Kirksville, Mo., and shortly thereafter I received a copy of the Osteopathic Journal published there, which gave a history of the treatment of this case. They found the child suffering with a dislocated spine and a dislocated hip. The barbarous machine applied by a man with a reputation for treating bone diseases was immediately removed, and by two or three skillful manipulations they succeeded in reducing both the spine and hip, and the dear little fellow was immediately able to walk with the aid of his crutches. This little miserable is now hopelessly deformed, and struggles about the streets by the aid of a long staff. This same minister, I understand, recommended from the pulpit in the most extravagant terms this infernal quackery. I know he visited and wrote to other parents advising them to seek relief in similar cases at Kirksville. This, I take it, is a fair example of the results of the treatment by these frauds.

The question might be asked here, how is it to be expected that the ordinary people are to avoid falling into the clutches of such charlatans when their ministers, judges, governors, and prominent men in other walks of life recommend them? I have endeavored to discover some little basis of merit in the practices as evidenced by their literature, but have failed so far. Massage might do some good in certain cases, if properly applied, but they do not suggest or describe this procedure on any scientific basis.

I will here quote the definition of this science as promulgated by A. T. Still, its discoverer, as he calls himself. If the members succeed in making any sense out of it, I wish they would "hold up their hands":

"I feel to answer through the Journal of Osteopathy questions that are asked by thousands of persons annually. And as time

adds days and years, the number of persons who ask those questions have multiplied to such greatness in numbers that it is absolutely impossible to find the time to answer them in detail. And I am not sure that I can answer all of them through the Journal, but will try and so arrange that a few of the most common ones will be answered as best I can. By my method of reasoning I arrive at the conclusion that man was, after receiving his form, like unto the world on which he dwells, and that in his body could be found all the mineral, vegetable, and animal substances that could be found in the beasts of the field, the fowls of the air, fishes of the sea, both great and small; in short, all that was contained in this and all other planets and beings from the throne of God (Himself included) to the lowest form of animated beings; that in the human being all attributes of mental and physical were represented in kind. With this conclusion I proceeded and did obtain what I have proclaimed and proven to be truths universal in kind and action, submitting to and being governed by one common law. I reasoned that all effects as are shown in disease with the result of the productions of truths of the one great common law, mind and motion expressing themselves through matter. Motion is an effect of life with its powers. Disease in any form or presentation was another effect. Conception of beings, diseases, and worlds were the biogenic answer of the wombs of nature either large or small, believing while I was in the chambers of sober and intelligent nature where honest reason only can dwell, that it was safe to follow the teachings of that principle that made no mistakes that I could detect. . . . The world's system of cures by drugs are now and always have been based on three principles, namely: Opiates, purgatives, and stimulants. And the difference there is in the schools of medicine are about all told in the quantities to be given. All give deadly poisons, but try to get the same results. Allopathy starts the ball to rolling by big pills, eclecticism the same, but claims that vegetable medicines are better than mineral preparations. Then the homeopath closes by pills of less size,

and if they fail he drives morphine under the skin and spills it in the fascia, which carries the opium to the brain and produces effects by paralyzing sensation. And on these three principles all depend."

The author of this very lucid definition of osteopathy lives at Kirksville, Mo., where the original school is located. Several other schools have been started at Kansas City, Chicago, here in Kentucky, and elsewhere, and have governmental sanction.

In Kentucky there is a law requiring those practicing osteopathy to pass a certain examination, but the law has not been productive so far of any great results. The school at Franklin continues, and several osteopaths are practicing elsewhere in the State, never having submitted to the examination. There are several cases in the courts now, and possibly one before the Court of Appeals, as a man practicing all kinds of quackery along with osteopathy resisted the State Board of Health and succeeded in getting an injunction in a Warren County court. This issue is now before the higher court or will soon be carried there, and will test the present law.

It would seem that as soon as an osteopathic school is established at a place it becomes a boom town. Kirksville has grown out of all proportion. The school collects a good round tuition fee in advance from every student, and they have large classes. The flocking of people is almost equal to a pilgrimage to one of the shrines of the Old World, and the place grows in consequence. One of the most pitiable facts connected with the practice of all quacks is that they get hold of many incurables whom the conscientious regular physician has frankly informed of this fact, and by promises hold them long enough to bleed them of all their means—old people with fractured hips, cancer cases, locomotor ataxia; and, as I mentioned before, osteopathy plays the mischief with the poor little suffering children with spinal and hip-diseases by their brutality in attempting to reduce the imaginary dislocations of the spine and other joints.

Why do the people allow such treatment? Where is their common sense? What is the fundamental cause of this condition of things? It has been recently stated that more than half the people in the world are worshiping fetiches. May it be because so recently the other half were in the same box, and are still influenced by the old atavistic superstitions, and jump at things mysterious and miraculous?

What tends to foster these ideas? Is it the fault of the scientist who fails to teach understandingly, or is it the church, which teaches them that miraculous things have happened in the world, and may be expected to happen again?

Dr. Thomas H. Manly, of New York, in a recent paper on this subject, says:

"There is no subject, perhaps, to which one may turn that presents so many intricate and singular features as that of the illegal or irregular practice of the healing art. It has been said that 'the practice of medicine is as old as history itself, but the science of medicine is scarcely fifty years old.' It may be added that the charlatan is older than either, and that, although the sciences have unfolded many of the mysteries of vital phenomena, and widespread educational advance over the entire civilized world has enlightened the masses, still it can not be denied that with all the revolutionizing influences following in the wake of these changes the demand for the empiric or the mountebank has not in the least diminished; nay, if we read aright the signs of the times, the eager avidity and ceaseless craving of communities for novelties, for new systems and creeds, for mysterious remedies and nostrums totally devoid of any warrant of scientific value, we must be convinced that education has rather given quackery deeper root and wider growth. Nor can it be said that the spread of the religious spirit and the greater adherence to dogmatic creeds have in any special manner lessened its growth or augmented the faith of the people in scientific medicine.

"During the last quarter of the nineteenth century, a period of America's greatest intellectual, scientific, and industrial activity,

sectarian medicine has made extraordinary progress; its most notable conquests being among the cultivated and aristocratic members of society."

The American Medico-Surgical Bulletin has something to say on this point in an editorial:

"Any unbiased analysis of the success of quackery in all its protean forms will reveal the fact that ignorance, fear, and self-interest are the forces that keep it alive. Only so far as the growth of civilization is a growth in intelligence among the masses does it in any degree check the career of the charlatan.

"Why can not something be done toward getting rid of quacks? The one answer to this is, that too many people are financially interested in the maintenance of quackery. When vested interests are opposed, honor, honesty, truth, and progress must step aside. Quacks are liberal advertisers, and always have been so. Newspapers and magazines lead the public mind. As long as this condition lasts, the masses are not likely to learn the truth very soon. But for the influence of the newspapers it would be an easy matter to force education upon all who attempt to treat the sick. Once educated, they would themselves lose faith in their present methods and use better ones. Once get rid of the present baneful influence of the press, and it will work a revolution of more importance to the life and health of the race than any thing that has happened for centuries. There is but one way to bring about such a change. Medical men must take into their hands the education of editors. If the average newspaper editors, and particularly those who edit religious papers, could be shown how positively immoral their present course is, a start would at once be made toward better things. Until they are taught, there can be no hope for the masses.

"When so able a writer and thinker as the editor of the Washington, D. C., Times can make a no better defense of the quack than he did in his issue of October 26th, under the heading of 'The Practice of Medicine,' it is evident that the task would not be so great as it at first might appear. He seems to think that the credulity of the masses in medical matters is itself a proof of the inefficiency of the medical profession. He tells us:

"'It is surely unbecoming in medical journals to ridicule the credulity of the masses of mankind in the light of the many fallacies that have ruled the profession, and in the light of its present uncertainties in therapeutics. What the profession has learned of value is that most of its dogmas were fraudulent. Any man who should attempt to cure disease in this day by the methods of the regular profession of only a century ago would be condemned as a quack more mischievous than all the army of "healers" who have found some use for a discovery of which they exaggerate the importance as much as the profession undervalues it. In spite of its greater knowledge of physiology and psychology, the medical profession neglects the virtues of moral treatment, and thus opens the way to persons who magnify them. It makes large claims to exclusive authority in healing, because of studies that have as little apparent influence in the treatment of disease as the knowledge of microbes.'"

The Memphis Lancet for November, 1898, while bewailing the present depraved level of the American press and indorsing the recent movement, the outgrowth of which has been the organization of "The American Society for Press Reform, and the Direction in which Press Reform is Needed," says:

"We are sure all will agree that the aim of such an organization is highly commendable, although we are compelled to admit that the accomplishment of that aim will probably never be attained while the daily papers pride themselves on publishing 'all the news,' and will probably bring their combined influence to bear against the passage of any law to curtail their liberty in this respect. But there are other practices to which they are addicted, and which to our mind are a greater evil than the publication of the details of crimes, criticism of officials, and the betrayal of State secrets. The greatest of these is the unbridled freedom with which they print advertisements of means for the prevention of conception, advertisements of abortionists and remedies intended to induce abortions, and remedies for the cure of venereal diseases, 'lost manhood,' etc., expressed in such unmistakable terms that 'he who runs may read.' Could any thing be more villainous? We wonder if the owners and managers

of these papers are conscious of their enormity. We wonder if our legislators ever take their minds from a contemplation of their chances for re-election long enough to realize that such practices are an offense against decency; that the fulfillment of the promises made in these offers are crimes against the State, and the papers which give publicity to these people and these agents are 'accessories before the act.'

"But such things are, and have been, and will be till the moral sense of the community rises to a plane which it now does not know. The financial return to the papers which publish these advertisements is probably not five dollars an edition, and yet for this 'Judas coin' the owners and managers prostitute their souls, insult their patrons, and fling defiance in the face of the State.

"We doubt if the publication of these facts will deter a single paper from accepting such advertisements, or influence a single person to withdraw his patronage from such as do. So long as the law does not forbid it, so long as 'lovely woman stoops to folly' and is willing to pay to be shielded from its consequences, so long as these people are prosperous enough to pay for space in the paper, just so long will these outrageous advertisements continue to appear."

I might enter into the discussion of the religious institutions, the shrines, Lourdes, knocks, the sepulchre of the Saviour, etc., all giving evidence of the wonderful power of the superstitions handed down from the ages gone by, which are fostered by the same craving on the part of the people for the miraculous.

As Zola puts it in his book, "Lourdes, the grotto, the cures, the miracles are, indeed, the creation of that need of the lie, that necessity for credulity, which is a characteristic of human nature."

What is the remedy to be applied for the correction of these evils? Bacon says, "Truth is the daughter of Time," but it seems to me that here we are at the end of the nineteenth century since Christ, and the lie is still with us. I will close with a quotation from an address by an Indiana physician, Dr. Jamison, on the sience of medicine and its relation to the people:

"To legislate against the dangers to which the victims of the pathy and cure delusions are subject, to protect such against

themselves, to suppress these so-called schools by law, would be right and wholesome. But we are reminded that what is right and wholesome is not always expedient or practicable. We are warned constantly that the remedy may be worse than the disease. Legislation would not and could not remove the conditions that make possible the various forms of medical charlatanism. Legislation against insanity can not cure insanity. It can, if it be wise, control its victims, relieve society from the menance which they are to it, and in a large way, and sometimes in apparently remote directions, tend to alleviate the conditions that produce the results deplored. Development is rarely round and even. Many can see life steadily, but 'to see life steadily and see it whole' is the good fortune of but few.

"Civil pride and duty are so much developed as to make it almost impossible to accomplish much in the direction of saving people by law against the fanaticism that trifles with the public health and destroys individual life. The spirit of liberty so much needed to rescue mankind from obvious forms of slavery and subjection, like all things in our ken, has the defect of its qualities, and we must accept with equanimity the idea that liberty of thought and action shall reach a condition that is really little short of anarchy. If a spurious coin were uttered in Massachusetts, the whole force of the commonwealth embodied in its laws would be invoked to suppress it and to punish the offender, because the utterance vitiates property and robs people of their material wealth. But a spurious sect may utter doctrines ruinous to health and to life itself, demoralizing where it is not destructive, sapping the sanity of people where it does not destroy their lives, and no measure of restraint or edict of abolition must be adopted!

"In this condition it behooves us, and all who seek to know the truth and to regulate their lives by it in order that they may attain the fullest possibility of life, to inculcate a more rational method of living. The caution can never be too strenuously made nor too often repeated that in times of expansion, enormous

expansion, such as the present is, it is not only wise but necessary that the mental and nervous organization should be brought to terms with it. We should seek by every means better to educate the public concerning the powers and limitations of the human organism, and the possibilities, not assumptions, of medicine; in other words, apprize them of the attainments of rational medicine. They should know that the only succor in disease must be the result of scientific attainment based on a knowledge of and obedience to the stable laws of nature. We are nearly out of the belief in or hope of relief by special providence.

"It is our duty—the duty of all who seek the truth—to maintain steadfastly that, were the special providences so ardently sought and so fervently importuned realized, the orderly processes of nature would be deranged and chaos would come. So now realization of dogma and pathy and school would mean simply that science must come to an end; that deduction must fail in its result; that truth must not be truth; that a thing that is necessarily one and the same, true under all circumstances, must no longer be so, but must give way to the erratic attainments of a pathy or cure that must be different in every part of the world, varying with every practitioner, the special creation of agent or patient, differing constantly as these differ.

"It is the duty and privilege of the medical profession, and equally the duty and privilege of all who hope for the advancement of mankind, with unalterable firmness and with limitless patience to enforce again and always the simple faith that there is no short cut or royal road to any thing, but only a steady, sure step, holding fast the ground won, toward the truth in all things as the patient endeavor of man may win truth by the reverent study of nature."

DISCUSSION.

Dr. B. W. Smock, Louisville: I feel like it would be criminal to sit here and listen to that most excellent paper without some of us putting ourselves on record in support of it. I think the most

serious thing in the present day is this so-called system of osteopathy. We might meet here as the Kentucky State Medical Society year in and year out, and resolute until we are tired of resoluting, but when action is to be taken we must look to the State Board of Health, which is a part of the government of our State. And I think it would be wise for us, not only as a society, but as individuals, to uphold the hands of this board. They can do nothing without our support. We know here in Louisville only a few years ago on almost every porch there was a banner, "Dr. So-and-So, Specialist," but the law of 1894 rid us of many of them. And you all know these star robbers who visit your towns and herald their great cures, which we, as medical men, know are lies. But this question of osteopathy confronts us. I was in the legislature when the bill was up to regulate some of these things, and you have no idea of the influence that was brought to break down our law and break down the State Board. We have a law that is a compromise, in that it compels these men to come before us and undergo an examination. There was only one individual that came before the board last year, and that was a lady, and if I had been a member of the board I would have voted for her, because she was a brave individual to come before that body. When the canvassers of the legislature come to us we can make the candidates say how they stand on the medical law. That is something that is done by the saloon-keepers and by the lawyers, and why can not we do it?

Dr. Dudley S. Reynolds, Louisville: Before we undertake the great difficulty of enacting laws for the people, we should stop prescribing secret compounds and proprietary nostrums, and giving certificates of their efficacy. This morning a lady came in and asked whether I would recommend her to purchase So-and-So's codliver oil for her child. I told her it was a substance the composition of which I did not know. She said it was recommended by two medical men of this city, whose certificates she presented in print.

IS INFECTION AND PUTREFACTION THE GENESIS OF MICRO-ORGANISMS?

By U. V. Williams, A. M., M. D.
Frankfort, Ky.

On a former occasion we endeavored to show that micro-organisms were the result of ptomaines developed by the fermentative and putrefactive decomposition of cells in both the animal and vegetable economy; that they were auto-generative and universally present, and were developed within the economy; that finding suitable environs were the causative and genesis of all pathological conditions; that they developed only when physiological conditions were in abeyance, and that many conditions of the normal growth of cell-life could be influenced catalytically into a generative condition, and exerted a specific abnormal action or generation, developing all the diseases of the human economy.

We hope to-day to be able to enter into the laboratory of nature, and show that the great producer of life in its normal condition is *light*; that light is motion, energy, vibration, heat; "that the spirit of God moved upon the waters, and the evening and the morning were the first day," the dark and the light, or the first result and form of matter, or of gases to form matter. It is conceded by such authorities as Lembitz, Helmholtz, Haeckel, Huxley, Tyndall, and others that heat is motion. Tyndall says: "The ideas of the most well-informed philosophers are as yet uncertain regarding the exact nature of the motion of heat, but the point at present is to regard it as *motion* of some kind."

William Clark Peckham says: "To the scientist, heat is the energy with which the molecules of matter vibrate; more heat,

more vibrations; less heat, a slower vibration; no heat, no vibrations. Every particle of matter is in motion so long as it contains heat, and the only absolute rest of matter that can be obtained is to remove all heat from it, thus reducing its energy to absolute zero or 491° below the freezing point of water, or the supposed temperature of space beyond the earth's atmosphere.

"The fundamental difference between the solid, liquid, and gaseous condition of substance lies in its cohesion. In a gas cohesion is altogether wanting; its molecules are separated by the greatest possible distance compatible with the space it occupies. A gas can not become a liquid or solid until its molecules have been brought into contiguity, and have become so accustomed one to the other, so to speak, that they will stay there under the conditions of the place where they are."

Stallo, Modern Physics, page 174, says: "Inasmuch, therefore, as the explanation of any phenomenon aims at the exhibiting of its genesis from its simplest beginnings, or from its earliest forms, the gaseous form of matter is the true basis for the explanation of the solid form, and not conversely, the solid for the explanation of the gas."

We might quote further from the authorities in confirmation of what we may say or conclude further on, but we have enough here to enter the practical conceptions of what should be conceded as normals or natural conditions.

We now have for consideration energy, heat, chemics, and mechanics. These embrace the entire field of experiment. Accepting the conclusion of others that energy is heat, we can eliminate the word energy and substitute heat, as we can only conceive of energy in motion, and this motion under positive direction. Then motion is heat, or, in the words of Tyndall, "heat is motion."

Proceeding, we take up Peckham's conclusion, which has been worked out by Prof. Dewar and others; starting from 491° below the freezing point of water, we are at a place where there

is absolutely no heat, no energy, no chemics, no mechanics, no life, nothing except the zero of all conception—chaos. Now, a white ray thrown into a motionless special rayless coldness would mechanically respond to obstructive resistance and reflect. This reflection departing from a straight line on a given position must result in an acute angle, the sum of these acute angles resulting in vibrations, and vibrations resulting in heat. Thus we have heat transmitted not ninety-three million miles, as for instance from the sun, as heat force, but the mechanics of heat in the obstructed white rays from the sun to the earth, at the point of the acute angle, the point of obstruction, thus causing vibrations, these vibrations being the motion of heat. The outer space area of air or the outer of the sun's system, being the dead line of energy or force, is not and mechanically can not be dissipated through these dead lines; all heat, then, must be confined to its ratios or limits of space in order to preserve its dissipation from the sun to all his belongings.

Now, the cell being the genesis of all life, we must, as the earth is enclosed by the atmosphere, conceive of this cell being enclosed in a shell, envelope, or cuticle, must be the functional primary of all existence, this shell like the atmosphere preventing dissipation and mechanically holding the normals or essentials of all things, of all life. As the concept of shell, envelope, or cuticule is to prevent dissipation, the holdings of this envelope are forces, and confined force equals the conception of pressure. Then, in the words of Huxley: "It is the purely mechanical view, toward which modern physiology is striving."

A normal physiological concept is a normal pressure; life is normal pressure. This brings us to the mechanics of pressure alone in order to solve the questions of normal and abnormal. If physicists and scientists have traced these varied and various orders of motion, heat, energy—any name we may choose to call it—and all of these again are traced back to the originals of conceptive motion, we have only the mentioned rays and vibrations to deal with in order to find the normals and

abnormals of life and death and disease. Scientists and physiologists have excogitated no plan of life's movements except through the one word — vibration. After this word we may use all the various orders of motion that experience has impressed us with mechanically, all regulations and orders organic and biological organizations are traceable to one word — *aeration*.

The work before us is to find the mechanics of aeration. We know in a definite way that motion depends absolutely upon the motion and energies of gases. We know, further, that all matter is composed of gases from their separated forms or atomic bodies to their agglomerated forms of cohesion in order to cause the motion of aeration. The gases must separate from their nascent orders and combine or reform into other matter, normal or abnormal, must be constructive tissue with a living and healthy cell, or abnormal with ptomaines or specific germs, fungi, or micro-organisms, just as mephitic gases liberated from the earth, losing their normal properties, may reform in space and descend to earth in the form of meteors or as dead matter. Assuming thus much, we have only to find the mechanics of aeration. As fermentation deals in aeration exclusively. Fermentation, from *fervere*, to boil. We know that the separated gases being lighter than water, the best normal order of solution, the gases are forced and confined to their cohesive area by the pressure of water within its area of bulk. Within this mechanical bulk or normal pressure now considered, what are the chemical-mechanics that cause the gases to move? We have in our way defined the position of heat, but in the words of Stallo placed the concepts of gases to solids, these being dependent on gravity. Authorities have given us no position for gravity. Mechanically we comprehend the concept of the vacuum process, heat from its most passive energies to its most accurate operations on the plan of the vacuum processes, all things within the sun system move on this plane, every part of the system is attracted to the sun. If its mass, as contended by astronomers, is in the area of heated gases, this heated area acting as a vacuum movement for all

other atoms, then gravity can through the concept of experience be that form of proportional entities that must be attracted or pulled to the sun from the earth's surface or center, the lighter atoms ascending or descending in proportion to their position or their densities, the more dense being pulled to the earth; the less dense on the basis of previously considered envelope pressure are moved or *pushed* from the earth; one ascending, the other descending, brings forward the action of heat for all it implies both as to motion, rapidity, direction, according to the amount of heat evolved. The more dense the stronger the pull to the earth, the less dense the stronger the push from the earth.

These two forces within the envelope operate either normally or abnormally through the order of aeration. The impact of the more dense on the molecules of the less dense generating the order of normal pressure, or non-dissipation of energy, these energies depending upon heat, the heat depending upon light or white rays within the cell, developing organic matter, and upon these vibrations within the developing elimination the form of gases, this elimination arrested develops ptomaines and degraded bioplasms which in the system assume the genesis of micro-organisms specific in accordance with environment and predisposition. These conditions can also assume the forms of solution and elimination retarded, and micro-organisms be generated. Ductless glands may lose the power to give off the gases, or eliminate the fluids and become the causative of abnormal conditions, producing ptomaines and micro-organisms, elimination being simply aeration, and aeration simply gases in motion, whether in the animal or vegetable kingdom, or in the domain of chemistry, physics, mechanics. As light is not only the source of all heat, all illumination, all energy, all motion, as well as all assimilation and all elimination, its kind and character determined by the white or dark rays, its operation through the agency of heat, its products determined by environment.

Physicists have given us no idea of the nature or requisites of diastase. We know it is found in the ptyalin of animals, in

buds and leaves of plants, and in vegetables. The microscope beautifully defines the position in inorganic life, if we consider it a product of development of light upon a growing or germinating plant, and defines its position in vibrations of white and dark rays, "*X-rays*" giving a white crystalline disk enclosed in an unbroken dark line circle, the proportion of other matter, as only a very small per cent is used up in fermentation. We simply wish to emphasize the importance of and identity of this diastasic influence or principle upon the vibrations or motions that produce energy or life, aeration not occurring synchronously with the diastatic-forming fats first, starches next, and after the concrete or hydro-carbons. Also we see that vegetable seeds carry this same organic principle and germinate, or, not posessing it, rot or fail to sprout or germinate. In the absence of organized diastatic germ, all cells must be chaotic and disorder, and void of that spirit that brooded and produced vibrations or life, and with this idea the difference between fermentation or normal aeration and putrefaction is one of density, heat, and movement, or *fervere*, to boil. The motion causing elimination because of extremes of densities can not occur in putrefaction, CO_2 not being eliminated. Life ceases in both animal and vegetable matter in consequence of pressure, differentiated in densities resulting in direct pull to the earth or gravity, so called, because both heat and motion are lost. The microscope defines these essential lines of refraction, or vibrations, and this chemical condition becoming mechanical, the most dense germs becoming toxines antagonizing normal principles.

The science of therapeutics, then, has to deal with special and normal densities or gravities, bringing these within the order of heat and pressure. In the outside world yeast and its environment is the only field of optical and experimental research, it becoming compulsatory to follow in the order of required densities or specific gravities pursuing the plan of putrefaction. In every characteristic of nature she adopts the universal plan of acid, base and neutral conforming to this plan, it becomes imper-

ative in its laboratory, always base pulled down to earth. Acid pushed up from earth, or either motion to a balance of energy is the universal and entire plan of nature. Pollen to the atmospheric crystalline base to the silk of corresponding distance necessary for oxidation or the required energy of production, and back through its next diffusion in order to the silk constituting the essentials of plant circulation. Exactly the same being true of animal life, the selected basic the spermatozoa the pollen, the ova or silk and a new basic formation or life, or cohesion. The atomic gases are forced back into fluids, semi-fluids or solids; this process failing from any cause, micro-organisms must and do necessarily follow, though the strongest lens has yet failed to see this cohesive movement, but yet will this be accomplished. Things are coming this way, and sometimes things come with a mighty rush and a large noise.

But just at this point sugar is formed, as we have on a former occasion contended. By this generation of sugar, fiber or tissue is formed; and just here, no environment favoring the generation of sugar, the whole tissue-forming conditions are reversed and toxins are formed, generating all the micro-organisms and so-called germs. The yeast germ is born, so to speak, without an enveloping shell or cuticle, its vital energy is soon dissipated, and at once becomes an aborted cell or dead matter circulating in vital or live cells, and causes putrefaction, and, because of its special gravity, pulls all of the same circulation or solution down to its own level, and hence the multiplication of micro-organisms, and rapidly increases the disease-producing conditions and environs, a condition which also spreads by the atmospheric sequences, and vast epidemics are present, which spread as fast and as wide extended as the motion of the air can extend. Whenever a system becomes through these conditions so enervated as to make the standard of elimination below that of infection, death of the cell and the individual is already assured; the normal pressure for life within the envelope not being the equal for the density of putrefaction, the normal condition of life

is pulled down, its cohesive fabric is destroyed, dissipation is consequent, and death inevitable because of the non-elimination of broken-down tissue consuming the fibrous form of body or special function.

The lowest form of specific gravity used in the animal economy is the biliary matter, so this is pulled down or pushed up as vitality is plus or minus, vitality assuming the white ray in normal action or the X-ray in abnormal, the X-ray or dark ray. In cell dissolution the X-ray predominates, and putrefaction resulting, these conditions being co-respondent, normal or abnormal conditions prevail, depending for life and assimilation or tending to death and putrefaction upon environment, all generative being first saccharine as taught by Liebig, who widely differs from Virchow, as he does from all other authorities. He says: "No more knowledge is needed, but more sight. The most powerful lenses stop just this side of the great discovery. The science of optics can not hope to resolve lines closer together than the length of one half a wave of light, and just beyond that limit lies the secret of life."

We have demonstrated that in fermentation, the only avenue opened of this kind to experience is that there can be no generation until the aeration or bubble is ruptured in contiguity of atmospheric air. Pasteur's experiments demonstrate that fact, and even his calcined air would not permit of aerated motion; nor is it reasonable to suppose that these vesicles holding gaseous atoms which Virchow's lenses never outline, failing in which it would be much more difficult to see, not through the cell, but through the gases of these cells entering the synthesis of formative gases, fluids, solids. On the other hand, if through vision or the imagination we saw cohesive matter as he seems to claim, it would still be a cell, and cell matter would bring us no nearer to spontaneous generation than we are now. And the spirit of God moved upon the face of the waters. We have thus, according to our conception, endeavored to show how nature moves in the creation of life, and that the principles are the same in all

forms of matter and obey certain unchangeable laws that will only and always produce the same conditions, whether these be the genesis of life or the other natural consequence, the death of all things living. It is as natural to die as to be born; that death is the decay of the individual, or cell, or molecule; that nature provides for the interment of the dead; that dead matter in the organic system pollutes the whole mass, and that disease is the perverted action of dead matter, not obeying the natural law of elimination.

And finally that all diseased conditions must be consequent upon retained or non-eliminated ptomaines and effete matter, and not upon external conditions; that if the latter could be possible, not only a sporadic or epidemic of certain or any character could prevail, but every one within its influence would have the same contagion present and develop the same disease at the same time.

DISCUSSION.

Dr. C. B. Graham, Henderson: The more heat the more vibration, the less heat the less vibration, and no heat no vibration. Cold reducing the thermal temperature and body heat below the normal, putrefactive changes develop the fungi and micrococci. Thus we may have an expression of the micrococcus intracellularis, the specific germ of cerebro-spinal meningitis.

Dr. U. V. Williams, Frankfort: The conclusions of my paper are found in the last two pages, which I did not read.

PECULIARITIES IN HEART AFFECTIONS IN CHILDREN.

By Philip F. Barbour, M. D.
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Heart affections in children exhibit so many variations from the accepted types of such diseases in adults that their mere recital would occupy your valuable time and be as uninteresting as such catalogues usually are. I will not, therefore, weary you by discussing congenital anomalies and other well-known peculiarities, but, selecting some of the more important differences, will direct your attention thereto, hoping to provoke further interest in these more or less obscure diseased conditions.

The liability to organic diseases of the heart and the infrequency of functional troubles may be mentioned as a peculiarity in childhood. The day has long since passed when rheumatism was classed as a disease affecting only adults. Now we know that it is very often observed in children, and I would have you note just here that rheumatism is much more apt to attack the heart of the child than that of the adult. This should be kept especially in mind, for after symptoms the most vague and unsatisfactory, from the standpoint of diagnosis, we may observe the development of an endo- or peri-carditis, which may seriously affect the chances of the patient for long life.

"Growing pains," which are so unworthy of notice by the laity, are sure harbingers of rheumatism, and oftentimes precede only shortly acute endocarditis. A wryneck or a tonsillitis may be the only manifestation of a rheumatic diathesis, but woe to the child whose physician is not thereby put on the alert. Chorea and erythema marginatum are equally significant, and all such cases should be watched closely by the physician, who may be

able to prevent endocarditis, though his therapeutic skill would be taxed to cure it.

Endocarditis is not always easily diagnosed in children. Heart sounds have not that definiteness that is acquired in later life. They are heard all over the chest, and in many cases may be auscultated best at the back. The second sound on the pulmonic side is louder than on the aortic. The extreme rapidity of the heart's action, coupled with the fact that the first sound is shorter and sharper than obtains later, make the differentiation between the two sounds sometimes difficult. In addition to these, functional, anemic, and other murmurs conspire to perplex and baffle the diagnostician.

Endocarditis involving a valve puts increased work on the heart and produces an hypertrophy which varies with the part of the heart affected. But the outlines of heart dulness and the position of the apex beat vary with the age of the child. The heart seems to occupy a more horizontal position in the child's thorax than in the adult's, for the apex beat is normally outside the mammillary line and in the fourth interspace. Toward the fourth year the apex reaches the nipple line and the fifth interspace, and thereafter approximates more and more closely the position it is to occupy in after years. So hypertrophy of the left ventricle in the child produces very great deviation of the apex beat to the left and a bulging of an enlarged precordial area. Mitral insufficiency is the most frequent lesion resulting from endocarditis, though the prenatal attacks are more apt to produce lesions of the right side of the heart. The fact that endocarditis may occur in childhood without those disagreeable sensations, pains, palpitation, etc., that are noticed in some adults should make us very careful in our treatment of infantile rheumatism to watch for and guard against the development of endocardial inflammation. It must not be forgotten that rheumatism is not the only disease that will produce endocarditis. Scarlet fever, diphtheria, and even measles have their quota of cases, and demand just as intelligent forethought on this point.

The course of endocarditis in children is very annoying and trying to the physician. It is absolutely necessary to keep the child in bed, to give the proper quantity and quality of food, and to maintain, through weeks of time, absolute rest, even though the child feels all right and is anxious to get up. Yet after the long and intelligent conduct of such a case, the departure of a loved nurse, the giving up of some pleasure, may produce an exacerbation of the trouble, and the whole battle must be fought over again. The tremendous influence of the nervous system must be kept in mind always. Then such agents as the iodids, which do such yeoman service in our adult cases, are not well borne by children when given for great length of time, not even the iodide of iron.

The disappearance of endocardial murmurs is sometimes noticed about puberty. Aortic stenosis seems to have the best prognosis in this respect of any of the valvular lesions. The natural growth of the heart must produce also an increase in the size of its openings, which may be sufficient to remove most of the obstruction at either the aortic or mitral orifice.

The complication of a pericarditis with an endocarditis and the development of a pericarditis solus must be noticed, for they occur too often in childhood. Pneumonia, empyema, rheumatism, scarlet fever, or Bright's disease may initiate an inflammation of the pericardium with its serious results. That many children die from an unnoticed and undiagnosed pericarditis has been demonstrated many times in the deadroom, yet with thorough examination of the child, and with the possibility of such lesions kept constantly in mind, such mistakes ought to be made but rarely. The consequences of fibrous adhesions between the surfaces of the pericardium or the entire ablation of the pericardial sac are of the greatest importance to the future well-being of the child, but their full elucidation would lead us beyond the scope of this paper.

The ease with which compensation is effected in childhood is remarkable. The growth of all the tissues and organs of the

body is provided for by nature, and most amply is provision made for the continuance of the heart in its functions during growth. When there is any derangement of the valves of the heart, and extra work is thereby thrown upon it, a compensatory hypertrophy of the organ occurs. Of course the increase in the size of the heart also interferes to some extent with the normal development of the lungs, but this is not of great import so long as the enlargement of the heart remains stationary. When, however, fresh endocarditis has been engrafted upon the old, or when some additional continued strain is put upon the already hypertrophied heart, it must either become more hypertrophied, undergo dilatation, or give way. If the hypertrophy can not keep pace with the dilatation, precordial distress, dropsy, etc., supervene and the patient is in great danger. Children have the advantage over adults in that growth is with them a normal process, and the heart very easily accommodates itself to increased work; and also in the fact that they are not sufferers from various conditions found in adult life, such as the vices of alcohol, tobacco, tea, etc., that are obnoxious to a healthy circulation. But while hypertrophy and hence compensation are easily attained in childhood, yet no precautions should be neglected that tend to prevent endocardial or myocardial inflammation, for there is a limit even in youth to perfect adaptation to circumstances. Thus hypertrophy is nature's means of overcoming heart difficulties; but, while our therapy is directed toward securing an adequate compensation, dilatation is to be feared. It marks the failure of the heart to accommodate itself to its work, and will occur in all cases of heart disease if the patient lives long enough; but acute dilatation is likely to develop in childhood as the result of severe acute diseases, and must be guarded against in such cases as well as in typhoid fever.

The relation of heart disease to the growth and development of the child is an interesting phase of our subject, but one to which we can allude only briefly. The lack of development is manifested in the stunted growth, the markedly delayed menstru-

ation, the failure of mental development, etc. This may in part be attributed to the anemia which so often accompanies heart disease, and which is due usually to the underlying rheumatic diathesis. Virchow has shown that there is an anemia that comes on about puberty, caused by disproportionate growth of the heart and blood-vessels; and there are also other causes for the anemia which should be taken into account. But aside from this, we find many cases of tardy development that may be ascribed directly to the condition of the heart. Some children whose stature is not affected will show the evil effects of the heart disease in an unnatural and incurable leanness and thinness.

Functional disorders are not of so exciting a nature as the same condition in adults; not that children do not suffer from alterations in the rhythm, rate, and force of the heart-beat, but because they do not have the mental disquiet, the fear of heart disease, that make palpitation such a dreaded neurosis to the adult. The sources of functional derangement are practically the same in childhood as in old age, but the pulse of youth responds more quickly to excitement. Even during sleep there may be variations in rhythm. If possible, however, the rate and other qualities of the pulse in babies should be ascertained when they are asleep.

In conclusion, I desire to call attention to the importance of a very slow heart action, or one in which the daily variation is excessive, as pointing to a meningeal inflammation, probably tubercular, from which children are so much more apt to suffer than are older people.

NORMAL SALT SOLUTIONS IN SURGERY.

By James B. Bullitt, M. D.
Louisville, Ky.

The use of the normal salt solution in surgery was the direct and natural result of the efforts at transfusion of the blood itself. This procedure is very ancient, was never any thing more than a curious experiment, however beautiful theoretically, and has quite deservedly been abandoned now entirely. The transfusion of blood from one animal to another of the same species, or to an animal of a different species, depended on the assumption that the receiving organism was able to appropriate and utilize the blood received as such, *i. e.*, that the blood-cells so transfused would continue to live and exercise their functions just as they did in the circulation of the host from whom they were obtained. It has been shown that such assumption was fallacious; in animals of like species, even, the blood-cells are not so received, but perish and break down, and so throw on the organism an additional eliminative strain. For animals of a different species it has been shown that the blood serum is often toxic, producing sometimes, if in sufficient amounts, even fatal effects. Furthermore, transfusion was always a difficult operation because of both the technical difficulties as well as that of securing proper and willing individuals from whom to obtain the blood.

These facts, added to the danger of the procedure from sepsis and embolism, have, as has been stated, practically completely relegated blood transfusion to the interesting medical history of the past, and have substituted therefor the use of the normal salt solution.

Infusion of milk and other albuminous fluids is an old procedure, but at this time the term infusion has come to signify the injection into the circulation of a normal (0.6 per cent) saline solution of a sufficiently high temperature.

According to Schachner, this particular procedure was first methodically called attention to by E. Schwartz in 1881, but there were isolated instances of such use before this time. However, it has only been since about 1889 that very general familiarity with the normal salt solution has been apparent; and even to-day it is believed many lives might be saved if surgeons and practitioners were universally cognizant of the importance of the procedure as a life-saving measure, and were more familiar with the simplicity of its technical employment.

In surgical practice the normal salt solution is useful in several ways: First, in case of extreme hemorrhage, to replenish the circulating medium and by refilling the blood-vessels permitting the mechanical acts of the circulation to proceed; second, in case of extreme shock, to stimulate the heart and arteries so that the blood which has accumulated and stagnated, especially in the large abdominal vessels, may again be put in active circulation; third, in cases of faulty and insufficient excretion on the part of the kidneys, to stimulate excretion, both by the kidneys and by the skin; fourth, in cases of sepsis, and perhaps in cases of drug toxemia, to favor by dilution and increased elimination the throwing off of the toxic materials.

It may be here remarked that this last usage is not so clearly defined nor well established as the first three; but many claims, supported by some cases, have been made of its great use in such conditions as diabetic coma, pneumonia, purpura hemorrhagica, ulcerative endocarditis, pyelitis, carbon-monoxide poisoning, mushroom poisoning, extensive burns, toxemia due to colon bacillus, painters' colic, carbolic acid poisoning.* In such conditions it is usually recommended to withdraw by venesection a certain portion of the blood, replacing it then by the nor-

* Thomas F. Reilly, M. D., in New York Medical Record, November 12, 1898.

mal salt solution. Such possibilities of its use are of the greatest interest, but beyond their mere mention they can not concern us further here.

While the physiological action of normal salt solution has not been elaborately studied, Bovée states that it seems to be determined that while it increases the volume of the blood and lessens its specific gravity, it at the same time stimulates the cardiac ganglia and arteries, and accelerates the circulation of the blood. The increased arterial tension furnishes more nutrient blood to the heart through the coronary arteries, and in like manner it stimulates the nerve centers. In the same way all the organs are made to do more work, and especially is it true that elimination through the kidneys and skin is markedly increased. Locally its action on the blood-vessels themselves is to stimulate contraction of the unstriped muscle fibers, and in this way it exercises a hemostatic action.

Reilly, quoting Delbert, states that it tends to produce hemostasis by stimulating clotting; but other writers hold the view already mentioned, that the hemostatic action depends entirely on the stimulation to contraction of the smaller arteries.

Dawbarn has insisted that the maximum of stimulation to both heart and blood-vessels is attained by injecting the salt solution at a temperature as hot as the hand can bear (110° to 120° F.), and cites the undoubted effect of hot intra-uterine douches in post-partal hemorrhage in support of his position. It has been shown that globulin only coagulates at 158° F. and serum albumen at 162° F. Experimentally, it has been shown that saline solutions of much higher temperatures, as high as 165° F. even, are well borne by the dog.

The salt solution can be introduced in several ways, thus: By injection into a vein, intravenously; by injection into an artery, intra-arterially; by injection beneath the skin into the connective tissue spaces, hypodermoclysis; by injection into the rectum and colon; by leaving the fluid in the abdominal cavity

after laparotomy. Each of these methods has its advantages and special indications, which will be considered presently.

Hemorrhage has always given the surgeon the greatest concern. Before the days of absorbable ligatures and the temporary elastic tourniquet it was the *bête noir* of surgery; and next to the advances which have resulted from the application of the knowledge of bacteriology to the uses of surgery, nothing has been more striking than the improvement in the technical ability to prevent hemorrhage, in the first place, and to deal with it successfully when it does occur, in the second place.

Death from hemorrhage may occur as a result of an absolute loss of blood, in which event not enough blood remains to support the vital functions, even if this amount could be kept in active circulation; or death may occur as a result of a relative loss of blood, the fatal issue in such case depending on the disturbance of the mechanism of circulation. Thus, if an insufficient amount of fluid is in the vessels, it becomes impossible for the heart and elastic arteries to transmit the force of the heart's contractions to the distant portions of the body, and as a consequence the blood which is left in the vessels fails to complete the circuit; nutrition and stimulation of the heart and all the centers fail, and death ensues.

Hunter states that in lower animals, even after the loss of one half or two thirds of the total amount of blood, death does not ensue if the circulation is maintained by supplying an indifferent fluid in the place of the lost blood. He calls attention to the fact that in some cases of pernicious anemia the number of red blood-cells may be reduced to ten per cent of their original number, or even less, and yet the disturbance of respiration may be little marked. Such losses, however, are sustained gradually, and are therefore better borne than if they occurred rapidly, as in sudden hemorrhage.

If more actual blood could be supplied rapidly in the first instance of the absolute loss of blood, it can readily be conceived that life could be saved and prolonged even after extremest

losses. But as it has been shown that the blood-cells as such are not accepted by the receiving organism, we must conclude that whenever the absolute loss of blood is so great as to render the remaining blood insufficient for nutrition and stimulation, even if kept in circulation, then death must ensue. When the loss is not so great the mechanism of the circulation can be restored by injecting into the circulation an indifferent fluid approaching or exceeding in quantity the blood lost. After such injection the rapidity with which the red blood-cells are resupplied by the organism is very surprising. A normal salt solution has been found most useful for the purpose, in that it supplies the fluid needed without doing any damage to the remaining blood. Plain water when injected directly into the vessels, on the other hand, extracts the hemoglobin from the red cells, and so acts as a poison.

Dawbarn reports a case where a mistake was made in experimenting on a dog, the animal dying in a minute after receiving a considerable amount of plain water so injected.

When the volume of blood in the vessels has been diminished by hemorrhage, a ready absorption of saline fluid takes place through all the routes mentioned. Where only moderate blood-loss has been sustained, it suffices for usual purposes to leave several quarts of the fluid in the abdomen in the case of laparotomy, or to inject a similar amount into the bowel with a long rectal tube. When the hemorrhage is more severe it is more quickly efficient to inject as much as a pint or a pint and a half into the connective tissue with the hypodermic needle, and permit it to get into the circulation more quickly by lymphatic absorption. When the hemorrhage is sudden and copious, and there is impending danger of failure of the circulation, the injection should be made into a vein, or, as Dawbarn first suggested in 1892, directly into an artery, preferably the femoral. This last mentioned procedure seems at first glance a heroic one, but the operation has been performed a number of times without accident and with marked success.

Circumstances might arise which would render its use important or imperative, and therefore the simplicity of its technique should be understood. For general use after hemorrhages which are not too severe, the subcutaneous method (hypodermoclysis) is undoubtedly the simplest and most useful. By its use there is little danger of overloading the circulation and further handicapping an already embarrassed heart. This danger exists in the incautious forcing into the circulation large quantities of saline in a short space of time by the intravenous or intra-arterial routes. The technique of these procedures will be taken up later.

It is a question of great importance to decide whether or not saline infusion should be used during the continuance of a concealed hemorrhage. Its physiological action is to increase the arterial tension, as we have seen, increasing thereby the blood-supply to the heart and stimulating the cardiac ganglia. It stimulates the blood-vessels locally, causing contraction of the arteries, and therefore acting in the case of the smaller vessels as a hemostatic. But this contraction would not be enough in the case of the larger vessels to effect hemostasis, while the increased arterial tension would make the bleeding all the greater.

Nature's method of arresting hemorrhage in the case of the larger vessels is by bleeding the individual until the circulation is so far weakened that a clot may form in the end of the divided vessel and no longer be extruded because of the pressure from behind. To increase this pressure by infusion would therefore defeat the very purpose intended.

In hemorrhage from smaller vessels the infusion would act directly as a hemostatic by stimulating contraction of the vessels. Thus in hemoptysis and in typhoid fever the infusion would be directly hemostatic if the vessels involved were not large, but might serve to increase the hemorrhage by increasing the arterial tension if the vessels were large.

When a concealed hemorrhage is suspected, the saline infusion may be employed as a means of making the differential diagnosis.

If the condition of the pulse is due to hemorrhage, saline solution by hypodermoclysis or by rectum will be readily taken up, and the pulse will be for the time much improved. If this method be employed, preparations should be made for immediate operation and securing the bleeding vessel. Otherwise the hemorrhage may only be further stimulated, with a fatal termination.

If the hemorrhage be not present, the probability of the rapid absorption of the saline solution and a consequent notable effect on the pulse is much diminished.

The quantity of saline solution which should be used after hemorrhage varies from a few ounces to a few quarts. The pulse-rate and volume and the general appearance of the patient must serve as the guide. Generally speaking, there is little danger of infusing enough of the solution after hemorrhage to cause an overburdening of the circulation. But it must be borne in mind that such overburdening can occur if the heart be very weak. Therefore it is usually safer to repeat infusions of small quantities rather than to attempt to make one large infusion serve.

Shock is a condition resulting from various kinds of trauma, as the crushing of a limb, a surgical operation, the concussion resulting from heavy blows; it may result also from the exhibition of a general anesthetic, and sometimes from profound emotions. It is a frequent accompaniment of accidents or operations attended with considerable hemorrhage, though it may occur without any blood-loss at all. It is characterized by a reflex paralysis of the heart and of the large blood-vessels, especially the abdominal, through the medium of the vaso-motor system. Death not infrequently results from this condition before reaction can be established.

In shock without hemorrhage there is no diminution in the total quantity of the circulating medium; but, as has been mentioned, it is not in active circulation, being collected for the most part in the large abdominal veins. The necessity here exists to

cause more fluid to enter the heart and to stimulate the flagging circulation. In such a case efficient absorption from rectum or by the lymphatic vessels (hypodermoclysis) can not be expected to take place. Therefore direct intravenous injection must be employed. The heart is weak and must not be overwhelmed by a large quantity of the solution, but should rather be stimulated to renewed strength and activity by small quantities of very hot saline solution (120° F.), repeated at intervals if necessary. Just as soon as improvement in the pulse is established, infusion should be discontinued, as the amount of blood in the vessels is quite sufficient for all needs, provided it can be made to circulate.

In shock with hemorrhage the treatment by saline infusion does not differ from that already described in the case of hemorrhage itself.

In case of insufficient excretion through the kidneys, stimulation of this function can usually be accomplished by saline injections into the bowel, from one to three quarts being so employed once or twice daily. By this means osmosis seems to be notably increased, and at the same time the skin acts much more freely.

McBurney reports a case of acute suppression of urine following removal of a large calculus from the kidney in which the urinary secretion was re-established by these injections. It is a matter of very common experience with abdominal surgeons to have the amount of urine following operations very notably increased by the employment of the saline solution at the time of operation, either by leaving a large amount in the abdominal cavity or by injection into the bowel.

These two measures have the further happy feature that they very materially diminish the post-operative thirst, which is oftentimes the most distressing feature of the first few days following a laparotomy.

Clarke has suggested with apparent good reason and practiced with marked success the so-called gravity drainage of the pelvis after laparotomy. The practice is based on the observations of

some Italian anatomists that there exist certain intra-abdominal currents which tend to carry fluids from the pelvis upward toward the diaphragm, where the principal absorption takes place, the peritoneum covering the diaphragm being much more extensively provided with lymphatic mouths than that of the remainder of the abdomen. Further, it is well recognized that bacterial growth is possible in proportion to the number of bacteria present and the amount of soil available. Clarke therefore concluded that if the abdomen after laparotomy were left filled with saline solution, and the pelvis were then elevated and so kept for the first few days, the intra-abdominal currents would then tend to lift any exudates, as serum and blood, out of the pelvis and carry them toward the diaphragm, where their more rapid absorption would occur for the anatomical reasons already stated.

Further, any bacteria which might be present in the pelvis in sufficient numbers and concentration to be a menace would be diluted and disposed of in the same way. At the same time the presence of the saline fluid in the abdomen would tend to prevent adhesions by floating the intestines away from the bared surfaces resulting from the operation, and the other benefits already mentioned would result from the absorption of the saline solution.

In sepsis Reilly,* quoting a number of writers, notably the French, regards intravenous infusion as almost a specific. It is necessary to use comparatively large quantities, and frequently to repeat the infusions.

Pozzi, who is a strong advocate of the treatment, believes that its *rationale* lies, in the first place, in the increased power of resistance due to the raising of the intravascular pressure and to the increased elimination which results therefrom; and, further, in the stimulation of the production of new blood-cells on the part of the blood-making organs.

The technique of the various procedures which have been described for the introduction of the solution is comparatively

*T. F. Reilly, Medical Record, November 12, 1892.

simple, and the necessary apparatus is readily improvised. The solution is prepared by adding a heaping teaspoonful of table salt to a quart of boiled water, and then straining. To be exactly accurate, to each quart of water ninety-two grains of chloride of sodium should be added. Any good specimen of water will serve, provided always after straining there are no foreign particles left floating in it. It is a significant fact that distilled water without the addition of salt is much more destructive to the red blood corpuscles than is ordinary water, evidently because of the traces of various salts contained in the latter. For general purposes it is convenient to make the solution in double strength, sterilize it by boiling, and then set it aside in cotton-stoppered bottles for the emergency, when the 0.6 per cent solution is quickly prepared by adding an equal amount of hot boiled water.

For rectal use the ordinary fountain syringe can be employed, together with a rectal tube or a long and large catheter. Or a piece of rubber tubing, a funnel, and a pitcher serve the same purpose. Or the Davidson syringe may be used. By rectum, of course, the scrupulous asepsis does not have to be observed which is essential in the remaining methods to be described. But this feature is common to all, that the maximum stimulation to the circulation and the organism is only attained by a high temperature of the solution, as hot as the hand can bear, 110° to 120° F.

When the fluid is employed intraperitoneally it is introduced at the last moment, just before the last stitch is tied to close the peritoneum.

For subcutaneous use the apparatus necessary is a good-sized hypodermic or aspirator needle and a piece of rubber tubing and a glass or metal funnel or a fountain syringe. The fluid is allowed to run through the needle, and it is then plunged through the skin into the connective tissue about the thighs, beneath the breasts, over the abdomen, or about the neck. In fact, almost any convenient locality answers. Of course the skin must be

made scrupulously clean before the needle pierces it. An elevation at arm's length suffices ordinarily to make the solution flow into and distend the connective tissues; sometimes an elevation of six or more feet may be necessary. As the fluid enters, the skin pouts out, and when a tumor the size of a small goose-egg has formed it is wise to withdraw the needle and insert it in another place, meanwhile rubbing the tumor with a greased hand to favor its speedy absorption. With usual aseptic precautions this method is devoid of danger.

The intravenous method is sometimes one of some difficulty, especially to one inexperienced in general surgical technique. The trouble is that in many cases in which it becomes necessary to employ the intravenous method a good deal of hemorrhage has occurred, and the veins are collapsed, and are not so easily identified. Usually a vein about the flexor aspect of the elbow is selected as most convenient; it is dissected out, and a double ligature, preferably of small catgut, is passed beneath it. The vein is now partially cut either across or longitudinally, and when it has become certain that the lumen of the vein has been entered, the distal portion of the vein is tied with one of the ligatures. The solution has previously been prepared in some form of fountain syringe with a blunt-pointed canula; a small-pointed glass medicine dropper answers the purpose well if nothing better is at hand; a sharp-pointed needle should not be used, as it is likely to pierce the wall of the vein, even if it primarily enters the lumen. The fluid is permitted to begin to run, and while it is running the canula is inserted into the vein. This avoids the possibility of air being injected along with the solution, which is undesirable, though apparently not as dangerous as many writers have assumed. Thus Hare experimentally injected 40 c. c. of air into the vein of a dog so that it went directly to the heart, and no perceptible impression was made on the circulation. Ordinarily it suffices to hold the container, which is preferably of glass, on high at arm's length; it must be borne in mind that it is not desirable to have the saline solution enter

the circulation too precipitately. Therefore the canula should be of small size; further, the flow can be very well regulated by the elevation of the reservoir, holding it higher with a very small canula and lower with a larger canula.

The second ligature is now tightened down over the proximal end of the vein with a double turn, holding the vein in close apposition to the canula. When the canula is finally withdrawn the ligature is further tightened and tied, a few skin sutures and a compress completing the operation. As the fluid flows through the vein from the tube the vein is noticeable as a raised line. On the contrary, if the fluid misses the vein and enters the subcutaneous tissue about it, the latter offers a marked and circumscribed swelling.

Bovée states that probably the maximum amount which can be safely introduced into the veins or subcutaneous cellular tissue is one ounce per minute. By this slow introduction most of the alarming symptoms and conditions which have been observed to follow the introduction of the salt solution can be avoided. Among these may be enumerated dyspnea, pulmonary edema, headache, vertigo, somnolence (probably from ventricular edema or cerebral hyperemia), mental excitement, delirium, and hallucinations. The more serious one of overwhelming the heart has already been mentioned.

There only remains to be discussed the intra-arterial method proposed and practiced in a few cases by Dawbarn. Bovée only mentions the method to say it should never be used. Reilly states that "on account of the danger of sloughing, the intra-arterial method is seldom employed." Dawbarn contends that there is practically no danger of sloughing if the technique which he describes is followed. This technique is as follows: The femoral artery is felt for beneath Poupart's ligament, and is located and fixed with the finger and thumb of the left hand on either side of it. A hypodermic needle, of good size preferably, is now pushed through the tissues into the artery. As the lumen of the artery will accommodate a lead pencil, Dawbarn states it

is not easy to miss it. As the needle enters the artery, a bright red thread of blood wells up through it. The rubber tubing of the Davidson or fountain syringe is now slipped over the needle with the solution running, thus avoiding the introduction of any air. The Davidson syringe is now vigorously pumped, or the fountain syringe is elevated six feet or more. The small size of the needle prevents the fluid from entering the artery too rapidly. In this way in requires about one-half hour to inject a pint of the solution.

In support of the safety of this measure Dawbarn cites the needling operation proposed by McEwen, of Glasgow, for aneurism, and employed with partial success by Dr. Wyeth in 1891. The aorta was pierced by thirteen needles, which were left in place twelve hours, and the operation was afterward twice repeated. Dawbarn argues with some apparent reason that if thirteen needles can be left in place in the wall of a diseased vessel for twelve hours, there would not seem to be much danger in leaving a single needle for a single hour in the wall of a healthy vessel.

Tillmanns, however, states that "Kummel warns against infusing salt solution into an artery. After the infusion with a glass syringe of about five hundred grammes of a six-per-cent alkaline salt solution into the radial artery, gangrene of the skin followed, rendering it necessary to amputate the forearm between the middle and lower thirds."

The method here described is, however, quite a different thing, and its misadventure need scarcely deter us from employing Dawbarn's technique if the necessity of the case demanded it. Certainly, however, such necessity will not often arise.

The intra-arterial method is centrifugal, whereby the possible danger of introduction of air is diminished. On the other hand, the intravenous method has the great advantage of carrying the infused solution directly and quickly to the heart, and so utilizing its heat for the maximum of stimulation to the circulatory organs.

One further use of the salt solution remains to be mentioned, viz., as an irrigating fluid for general purposes. It is believed to be less irritating than plain water.

DISCUSSION.

Dr. AUGUST SCHACHNER, Louisville: I would like to call attention first to the preparation of the normal salt solution. If the normal salt solution is prepared and sterilized as it should be, sterilized in the fractional way, the first day ten or fifteen minutes, the second day five minutes, and the third day also five minutes, we will destroy all germs and the spores of germs. Whether it is water that has been distilled or ordinary water that is free from mineral matter or containing mineral matter, we will find that the water often contains flocculi. When an intravenous injection is made, there is some danger from emboli from these fine flocculi. In support of the fact that this is not an imaginary danger, I would like to record a case reported some years ago at Johns Hopkins Hospital. A wife of a physician was operated on there for extra-uterine pregnancy. Hemorrhage followed, and it became necessary to make an intravenous injection of salt solution. The precaution to remove the fine flocculi was overlooked, and as a result there was embolism of the vessels of the arm, which resulted in gangrene of the arm, and, although the life of the patient was saved, she lost her arm. This is a very practical point to which I would like to call the Society's attention, and another practical point is the manner of making the injections. It seems like a very simple little operation, but there is quite a trick about it. For instance, whenever it becomes necessary to make an intravenous injection for hemorrhage, we find that the veins do not come up as they do under ordinary circumstances. We find the veins are largely empty from the loss of blood, and as the result of this it is quite difficult to expose a vein. Now, if in making an intravenous injection you will allow the hot salt solution to flow up against the lips of the vein, it will be opened and you will at the same time exclude the possibility of the entrance of air.

Dr. JOHN A. LEWIS, Georgetown: The portion of the paper read interested me very much, and I would liked to have heard the entire paper. Yesterday I suggested the use of the salt solution in certain non-surgical diseases. In the discussion of cerebro-spinal meningitis,

you will recall I said that as the treatment, as acknowledged by all, is a failure, it has occurred to me that possibly in these desperate cases the withdrawal of perhaps a pint of fluid followed immediately by the introduction of a pint of the normal salt solution might give a better result. I have not heard the suggestion, but I would commend it to the profession as worth a trial. Such a procedure would dilute or attenuate the poison and thus lessen the virulence of the disease, and at the same time it would increase elimination. The tendency is toward asthenia, but by introducing the saline solution you overcome this.

Dr. ARTHUR MCCORMACK, Bowling Green: Everybody must have been impressed with the paper. I would like to refer to the doctor's remark that the salt solution must be sterilized from three to five days before the hemorrhage occurs. If we applied that, most of us would either not do the operation or not have the hemorrhage.

Dr. J. H. LETCHER, Henderson: I was sorry not to hear the doctor's paper, for it was the one paper on the programme that I think of most value. I have had some experience with the salt solution, and I think the time has come when we as country practitioners must feel it important to be prepared to use this preparation. I think we should prepare our saline solution beforehand, at least in concentrated form. Then we can use boiled water at the time, for the purpose of dilution, and I do not think there is any danger at all in the use of it. I rather prefer the intracellular use of the salt solution, because when you are pressed by other work your nurse can then use it for you. In railroad surgery I have seen the very best results follow its use. I regret exceedingly that I did not hear the doctor's entire paper, and I trust that in closing the discussion he will be permitted to give the cardinal points in his paper. I want to add my testimony to the excellent results that may be obtained from the use of the salt solution. If you do not care to take time to find a vein, you will get good results from throwing the solution under the skin. You will then save the time that otherwise would be occupied in searching for a vein, for it does take a little time to make the intravenous injection. And then I agree that you should not use the solution once, but again and again, not only for a few hours, but if necessary for a few days. When any thing depletes the system, as in the bowel troubles of children, it is invaluable. I believe the time has come when we should have these things in our offices and be prepared to use them.

A MEMBER: Any thing that is worth doing at all is worth doing well, but in a case of emergency we may not always have the normal salt solution at hand. We do not rely upon the virtue of the chloride of sodium, but we want fluid in cases of collapse, which occur, not from the absence of certain medicinal agents which might be present in the salt solution, but from the absence of water. Thus under certain circumstances we can conceive that it might be advisable to introduce water without the addition of salt.

Dr. W. C. DUGAN, Louisville: I am sorry the gentlemen put down to discuss the paper are not here, because this is one of the most important life-saving methods I know of. I am satisfied that I have saved lives by this procedure. The injection into the submammary space is perhaps the best method. Lift up the mammary gland and you can inject beneath it quite a quantity of the normal salt solution. In cases of emergency I prefer injecting into a vein. I have not found any difficulty in finding the veins. The median cephalic is easily located. If you make an incision in the proper direction you will expose the vein without any difficulty at all. You should lift up the vein entirely, then with the needle full, or with an ordinary pipette, which I have used in some cases, introduced well into the vein, you may use such a quantity of the normal salt solution as will have a direct effect on the tension and volume of the pulse. It is very effective indeed. In regard to the quantity, the essayist made a good point, that is, not to use too much at a time, but to repeat the operation if necessary. In a case of extra-uterine pregnancy, with a pulse of 160–180, I injected a quantity into the submammary tissue at various times for two or three days, and finally the patient made an uninterrupted recovery.

Dr. W. B. GOSSETT, Louisville: A great deal can be done to save a great many patients, especially where you have a severe hemorrhage. You can then use the hot douche, say just after a post-partum hemorrhage when the patient has lost considerable blood. Take, say, a teaspoonful of common salt to a pint of water and introduce a gallon or two into the vagina and rectum and a great deal of the fluid will be absorbed, especially from the rectum. This is of great value in the hemorrhage following placenta previa, where we lose a great many patients from hemorrhage. When the child has been delivered in the manual way often we have severe hemorrhage. For this hemorrhage we may use from half a gallon to a gallon, or even three gallons of a salt solution. In that way you will save a great many cases that could not be reached in any other way.

Dr. C. L. Bonifield, Cincinnati: I want to thank the Society first for the privilege of the floor, and then add my testimony to the value of the saline solution. I never under any circumstances fail to speak in favor of the salt solution when I have an opportunity, because I regard it as one of the greatest life-saving procedures of recent years. I want to compliment Dr. Bullitt upon his paper, which I think excellent in every way. The gentlemen have learned that any thing worth doing is worth doing well, but in these cases if we take too much pains and time the patient will die while we are doing it. While in hospitals we can have the saline solution ready for use days before the time for the operation, yet in country practice and in private hospitals this is often not done. Then the physician may be sure that he will not kill his patient by injecting ordinary boiled water containing the necessary amount of salt. In reference to the relative merits of the different methods, the subcutaneous injection is much easier than the intravenous injection, but it does not give as prompt effect by any manner of means. But if the patient is in collapse and the physician does not feel that he can readily find the veins, he may first introduce several ounces of the salt solution under the skin and then proceed to open the vein. It has been my experience that the vein is comparatively easy to find. Of course it is necessary to obstruct the vessel so it will swell out. You do not need any complicated instruments, but grasp the vein and introduce the medicine dropper attached to a fountain syringe, and let the water run in under moderate pressure. I do not think it is likely you will introduce too much fluid if the pressure is not great. I often introduce as much as two quarts of water when the shock is profound. It is seldom necessary to reopen a vein unless further hemorrhage takes place. The further effect of salt solution may be gotten by its introduction into the rectum, which absorbs the water very readily but does not give the effect of intravenous injections. So by all means the best method of introducing the saline solution is through the vein, and I hope every doctor in the State of Kentucky and in the United States will feel himself competent to do this, and do it whenever occasion requires.

Dr. R. C. McChord, Lebanon: The case has been recorded that the mistake of not putting the salt into an injection into a dog proved fatal. Of course that is an isolated case, but it is a case that should be borne in mind. I am glad this subject has elicited so much discussion, and I am only sorry the doctor did not get to finish his paper. I hope that in the conclusion of the discussion he will go more into

detail and give us the points that were contained in the latter part of his paper. A valuable point was made by the gentleman from Ohio, that is, that when we have considerable hemorrhage an injection may first be made into the cellular tissue, and then the vein can be opened subsequently.

Dr. TAYLOR, Greensboro: Patients suffering from acute septicemia or Bright's disease bear operations very well if preceded by the salt infusion. They then stand the shock much better and recover much better.

Dr. EDWARD SPEIDEL, Louisville: I would suggest the use of an apparatus that can be carried in any satchel. It consists simply of a four-ounce glass funnel, two feet of rubber tubing, and an aspirator needle, which is pushed into the tube. This can be sterilized at home, wrapped in a clean towel, and packed in any satchel. The manner of using it is to pour the fluid into the funnel, and, while the fluid is flowing, introduce the needle into the vein or cellular tissue. The text-books recommend the space between the scapulæ, I think, as the proper place. I would suggest the right and left hypochondriac regions of the abdomen as better. You can not always secure absolute cleanliness, and in case of abscess between the scapulæ or on the thigh, there is considerable trouble.

Dr. F. J. YAGER, Campbellsburg: I want to make a few plain, simple statements. I like this theory of action. There is no impediment or obstruction in its way. There are enough avenues in the human system through which to introduce this material, which requires no question as to its general use. I believe there are enough plain statements made as to its work and general practicability for us not to question that any further. The gentleman who introduced this subject has made it exceedingly plain. We only need to prosecute its use. I have never had a favorable opinion of any such thing acting upon the human system, but this is an innocent drug, and no danger can come from its use. These gentlemen have made it perfectly plain and sensible and practicable. Now we have only to study and practice its use, and the results coming from it will be of almost incalculable benefit to the human family. The gentlemen who have made such strides in its use I hope will prescribe it and even further simplify it if possible.

Dr. B. F. PARRISH, Midway: Speaking of an apparatus for use in this injection, I know of no reason for carring a special apparatus. Every man has a fountain syringe and a hypodermic needle, which is all he wants. He can cut down to a vein, introduce the needle

attached to his syringe, and the fluid will enter. It is not necessary to use a special apparatus.

Dr. JAMES B. BULLITT, Louisville: I shall only attempt now to take up a few points in this discussion. First, in reference to whether simple water will suffice. I think it will not. There are several things we do know that indicate that simple water, especially distilled water, acts as a poison when put into the circulation. Reilly, in a recent article in the Medical Record, states that normal salt solution is absolutely non-toxic, that ordinary water is almost harmless, but that distilled water is very toxic when injected into the blood. Ordinary water is less toxic than distilled water, I take it, because it contains always various saline substances which possibly take the place of the chloride of sodium, for chloride of sodium you will all remember is not the only salt found in the blood. So I do not think it is safe to depend upon the injection of simple water. Then as to the manner of preparing the solution and the apparatus; both are very simple. Just as we become aware of the simplicity of this procedure, just so will it come into general use. I am satisfied it is one of the most important things that not only the surgeon but the physician can come to know, the many uses to which the saline infusion can be adapted. I agree with Dr. McCormack, that if we knew beforehand that we would have a hemorrhage, we probably would not have it; but I think he must be an Irishman or he would not have thought of that remark. The fractional sterilization may be practiced in hospitals, but that is not essential for our purpose. Boiled water, boiled from five to fifteen minutes, is sterile. But in hospitals it is often convenient to prepare it in twice the 0.6 per cent strength and store it away. When you want to use it, take half the amount from the salt water bottle and half from the water bottle, and your solution is ready for use. In country practice this is not practicable. But I believe the apparatus should always be sterilized before making the infusion. Any thing used in making the infusion should be boiled, and any thing boiled from five to fifteen minutes is clean enough for all practical purposes. I would call the attention of the gentlemen to the fact that the domestic teapot is often one of the best things that can be used. When a vessel or pan is brought to you, you don't know whether it is sterile. The people say it is clean, but in the surgical sense of the word it is not clean. But the old teapot is almost always sterile. It may have a few black flakes on the side from oxidation, but by straining you can be sure that you will get a fluid that is sterile. In making the intra-uterine injections in obstetrical practice, I often prefer to use a teapot. The funnel and tube and needle can all be put on the fire and boiled.

PERITONITIS FROM A CLINICAL STANDPOINT.

By August Schachner, M. D.
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Practically speaking, peritonitis is as old as the healing art, but old as the subject is, there yet remains much to be understood about peritonitis and the peritoneum. In the settlement of all unsettled subjects, and certainly peritonitis is entitled to a membership in this class, it is well to pause from time to time in order to digest thoroughly the additions that have been made; to compare the old with the new, to emphasize the important over the unimportant, and, in short, to have a "round up," so to speak, from which another advance can be made. This is the object of the present paper, and for this reason it is a somewhat disconnected presentation of facts bearing upon peritonitis rather than a systematic essay upon the subject. The classification of peritonitis may be based upon its causation or its pathology. Considering its causation, it has been divided into primary, secondary, and specific. Viewing it from the standpoint of its pathology, the classification of Pawlowsky is perhaps the most accurate, namely:

1. An extremely toxic variety, in which the virulence of the infecting organism is so great that the patient is at once overwhelmed and dies within forty-eight hours with all the signs of shock. In these cases the peritoneum is covered with a slimy fluid containing a few blood-corpuscles, fibrin flakes, and many bacteria.

2. Hemorrhagic peritonitis, in which the virulence of the infection is also very great. Varying grades of hemorrhagic extravasations, with a greater or lesser mixture of pus and masses of bacteria, are found.

3. Fibrino-purulent peritonitis, due to a less intense or slower infection, characterized by masses of fibrino-purulent matter, consisting principally of pus-corpuscles and bacteria contained in the fibrin masses.

4. Purulent peritonitis, consisting of much pus and fluid matter.

The possibility of a primary or an acute idiopathic peritonitis, either with or without the presence of pus, is extremely interesting. According to most authorities, the purulent form at least never occurs. Even where pus is not present the existence of peritonitis is held by the majority as an evidence of some other trouble within the peritoneal cavity, and upon which the occurrence of the peritonitis is dependent. If we consider, however, that in the early stages of the embryo the thorax and abdomen are represented by one common cavity known as the pleuro-peritoneal cavity, and only by the advent of the diaphragm are these cavities separated, we can readily see how difficult it is to reconcile ourselves to the impossibility of an idiopathic peritonitis when the pleura, which is only a part of the original peritoneum, which has been separated by the diaphragm, is so commonly subjected to inflammation with or without the occurrence of pus. Some might contend that the arrangement above the diaphragm is responsible for the very common idiopathic attacks of pleuritis as compared with the questionable idiopathic peritonitis below the diaphragm, namely: The influence of the proximity of the lungs from within the thorax and the exposure to changes from without. But this is offset by the proximity of the peritoneum to the alimentary tract, filled with a variety of organisms and the seat of constant chemical action, together with the same external influences that hold good above the diaphragm. Since the causes ascribed to idiopathic peritonitis, namely, exposure to cold and rheumatism, are quite unsatisfactory and apply with the same force above as below the diaphragm, it leaves the question in any thing but a settled condition.

The secondary variety always follows some primary lesion, usually a perforation of some of the hollow viscera.

By the specific variety it is usually understood as meaning tubercular peritonitis. From the masterly contribution upon intra-peritoneal drainage by Dr. J. G. Clark, of Baltimore, I have taken the following abstract:

"According to Wegner, the peritoneal surface measuring 17,182 square centimeters is practically equal to the skin surface, which measures 17,502 square centimeters. Its absorbing capacity enables it to take up three to eight per cent of the entire body weight within an hour. Under the influence of toxic or irritant substances an equal transudation into the peritoneal cavity may take place.

As the final results of a series of experiments, Muscatello concludes that the diaphragmatic part of the peritoneum is the only place where the lymph from the peritoneal cavity is absorbed, and the lymph-glands of the mediastinum are the collecting organs for this area.

Recklinghausen investigated the mechanism of the absorption of fluids in the peritoneal cavity of rabbits, and affirms that the fluid is taken up through the stomata between the endothelium of the diaphragmatic peritoneum.

To summarize, the points in the anatomy and function of the peritoneum which bear upon the subject of intra-peritoneal drainage and the etiology of peritonitis are as follows:

1. Fluids and solids may pass through the endothelial layer of the peritoneum, the fluids in many places, the solid particles only through the spaces in the diaphragm.

2. Minute solid particles are carried from the peritoneal cavity through the diaphragm into the mediastinal lymph-vessels and glands, and thence into the blood circulation, by which they are distributed to the abdominal organs, to appear later in the collecting lymph-glands of these organs.

3. Large quantities of fluids may be absorbed by the peritoneum in an astonishingly short time.

4. The leucocytes are largely the bearers of foreign bodies from the peritoneal cavity, which carries fluids and foreign particles toward the diaphragm, regardless of the posture of the animal, although gravity can greatly favor or retard the current.

Grawitz took up the experimental study of infection of peritoneum, pursuing his work under improved bacteriological technique. The results of his investigations, which appear to have been very thorough, were as follows:

1. The introduction of non-pyogenic organisms into the abdominal cavity, either in small or large quantity, or mixed with formed particles, produces no harm.

2. Great quantities of organisms, which ordinarily produce no disturbance, may give rise to a general sepsis if the absorptive ability of the peritoneum is impaired.

3. The injection into the peritoneal cavity of pyogenic organisms may be quite as harmless as the non-pathogenic varieties. In these experiments he employed a flocculent emulsion of staphylococcus albus, staphylococcus aureus, and streptococcus pyogenes in ten cubic centimeters of water without any visible reaction.

4. The introduction of pus-producing cocci into the normal peritoneal cavity produces a purulent peritonitis (*a*) if the culture fluid is difficult of absorption; (*b*) if irritating material is present which destroys the tissues of the peritoneum, and thus prepares a place for the lodgment of the organisms; (*c*) a purulent peritonitis will certainly be produced if a wound of the abdominal wall is present, which forms a nidus for the infectious process.

The experiments of Cobbett and Melsome make more prominent the fact brought out by previous observers, that even after the injection of virulent streptococci little or no peritonitis may be produced if the peritoneum is normal.

From the collective literature the following conclusions may be drawn:

1. Under normal conditions the peritoneum can dispose of pyogenic organisms in varying quantities, depending upon the virulence of the organism, without producing peritonitis.

2. The less the absorption from the peritoneal cavity the greater the danger of infection.

3. Solid sterile particles are partly absorbed, and the remainder encapsulated without the production of peritonitis.

4. Death may be produced by general septicemia, and not peritonitis, where large quantities of organisms are taken up by the lymph streams.

5. Peritonitis may be produced if the culture fluid is difficult of absorption.

6. Irritant material which destroys the tissues of the peritoneum prepares a place for the lodgment of organisms and the starting-place for peritonitis.

7. An infected stitch-hole tract or localized phlegmon communicating with the peritoneum forms an excellent starting-place for general peritonitis.

8. Stagnation of degenerated fluid in dead spaces favors the growth of organisms.

9. The presence of infected blood-clots is especially liable to cause a virulent peritonitis.

10. Injury to the abdominal viscera, such as strangulation of an intestine, constriction and ligation of large areas of tissue in the presence of pyogenic organisms, will almost certainly be followed by peritonitis."

Mr. Lawson Tait, in a presidental address published in the British Medical Journal, November 12, 1892, expresses in his usual style some interesting views upon this subject. Speaking particularly of post-operative peritonitis, he favors the idea that peritonitis is largely dependent upon the nervous system. He believes that there is an ebb and flow in the peritoneum, and that the great omentum is the arbiter of these intra-peritoneal currents. In support of these ideas he mentions the peculiar behavior of ascites dependent upon papillomatous disease of the

peritoneum. The cause of death is the disturbance of the ebb and flow of the serum-stream of the peritoneum and the disturbance of the function of the liver. He believes the liver to be the lethal organ in peritonitis. That the intra-peritoneal flow is checked is indicated by two things: First, the peritoneum is dry and free from effusion in proportion to the acuteness of the attack. The second point is the increased quantity of biliary fluid thrown off by the liver, as being due to the increased quantity of fluid passed into the portal circulation by the arrest of the intra-peritoneal flow.

The foregoing are but disconnected links in the somewhat broken chain that represents the pathology of peritonitis. Some of these links stand out in bold relief. Absorption and transudation are admitted upon all sides, and this admission clinches the idea of certain intra-peritoneal currents. The currents in all likelihood move toward the diaphragm. In fact, if we take a rough glance at the anatomy of the human subject divested of its extremities, we see the trunk in the form of a cylinder divided into unequal halves by the diaphragm and covered externally by a highly absorbent membrane on the outside called the skin, and by a still more highly absorbent membrane on the inside called the peritoneum. In fact, the absorbing capacity of the peritoneum is such that it must be referred to as a colossal lymph sac in order to fully grasp the meaning of peritonitis in all its details.

Treatment. In considering the treatment of peritonitis, we deem it best to divide it into the post-operative, purulent, and specific, rather than to employ the classification already laid down; since we are not always able at the time of treatment to say as positively the character of peritonitis we are dealing with as we are after an ante- or post-mortem section has been made. Again, the post-operative peritonitis carries with it a clearer idea as to its causation and internal relations, and has prophylaxis as the uppermost feature in its management. The purulent peri-

tonitis is generally more obscure as to its causation and internal relations, and carries with it the idea of active interference.

The specific, or more properly speaking tubercular, since the latter practically represents specific peritonitis, requires the proper classification before we are able to say which cases should be subjected to and will be benefited by an abdominal section, and which should not be and will be hastened to their end by operative measures.

The paper of Mr. Tait, already referred to, while containing some features that are at variance with many well-accepted ideas, is nevertheless based upon an extraordinary experience, and, coming from one of our ablest clinicians, it merits our critical attention. The keynote of the paper is prophylaxis during and after the operation. We all know that while Mr. Tait does not accept Lister's teachings scientifically, he does so at least practically. However, for the prophylaxis during the operation we can obtain clearer ideas from the contribution of Dr. Clark, already referred to in this paper. Mr. Tait considers a thoroughly developed case of post-operative peritonitis as about as hopeless a condition as one can possibly meet, therefore he fights it most vigorously at its earliest onset, and prevents rather than attempts to cure. He goes on the principle that unless it is recognized in its incipiency there is no need of its recognition at all, for the patient is soon beyond redemption. He practically discards temperature and pulse, and relies almost wholly upon the appearance of distension and the alteration of the face. One does not need an extensive experience in abdominal work to realize the uncertainty of the temperature as an index to danger, but we doubt if Mr. Tait's disregard for the value of the pulse as an index of trouble would meet with any considerable support. The slightest evidence of distension in the infra-sternal triangle is looked upon as a sign of trouble. In justice to Mr. Tait it must be said that he expressly mentions that the appearance of distension is not necessarily conclusive evidence of peritonitis, but by considering it in that light and shaping his action

accordingly he gains valuable ground if it should be due to a commencing peritonitis, and would lose nothing if it were not so. In short, he is more interested in protecting his patient than he is in verifying his suspicions.

The alteration of the face, which is of greatest importance, is not one of pain, but one of anxiety. To use Mr. Tait's own words, "if she is quiet and will not talk, she is sure to get well; if she persistently chatters, she is sure to die; on relief of the symptoms, which means getting the bowels to move, the face becomes placid and the patient is quiet." From this we are enabled to sum up the treatment of post-operative peritonitis in the following words: Excluding as much as possible the infection and preserving as much as possible the integrity of the peritoneum during the operation, and maintaining as much as possible the intra-peritoneal drainage after the operation.

The first two of these three directions carries us into the conditions underlying the infection of wounds, an immense subject in itself, and the last means maintaining the free and unrestricted functions of the intestinal tract.

The treatment of purulent peritonitis, and by this term we mean cases of the third and fourth variety of Pawlowsky's classification, since the cases of the first and second are too rapidly fatal to admit of any interference, is not developed sufficiently to formulate hard and fast rules governing all cases. The degree of success attending the treatment of these cases will always depend upon the judgment exercised and the thoroughness with which the surgeon does his duty. Too much stress can not be laid upon the frequent inexcusable delay in calling in the surgeon. Frequently the surgeon's work amounts to nothing more than an ante-mortem examination and irrigation of the abdominal cavity. Operative interference must be undertaken before the patient is in extremis, and even then a properly worded prognosis should be expressed in order to prevent misleading ideas that constantly arise regarding surgery in general and the operation in particular. It is like operating for typhoid perforations—any percentage of

recoveries, however low, is a credit to surgery and a triumph for the surgeon. The recently reported successes of McCosh, McBurney, Abbe, Van Arsdale, and others should give encouragement to efforts in this direction. The question upon which there seems to be a division of opinion relates not so much to what is to be done as to the manner of doing it.

Some favor a large, free incision with complete evisceration and the thorough irrigation of the peritoneal cavity and the eviscerated intestines with normal salt solution having the temperature of 115° F. Others rely upon irrigation with enormous quantities of hot salt solution without evisceration. Some favor mutiple incisions and the introduction of a number of drainage-tubes or gauze, and others rely upon one large incision. But it is self-evident that the method must be suited to the case, rather than suiting the cases to the method. Another mooted point is the propriety of removing the deposits of fibrin so commonly found covering the intestine. Many contend that nature is able to cope with these, and their removal only opens up new avenues for the entrance of infection. Some favor mopping the peritoneal cavity with gauze wrung from hot salt solution in preference to cleansing by irrigation. Dr. Andrew McCosh has suggested the very excellent idea of an intra-intestinal injection of one or two ounces of a saturated solution of magnesium sulphate, the injection being made into the small intestine, this being supplementary to a cleansing of the peritoneal cavity.

Recently Van Arsdale recommended, in addition to the usual measures for cleansing the cavity, the suturing of an incised knuckle of intestine to the abdominal incision, the advantage being that it affords an opening for the escape of gas and fecal masses, the latter doing harm by their stagnation and putrefaction. It is also a protection against obstruction that might occur through angulation or compression by the drainage-tube or gauze.

According to Frederick Treves, operation for tubercular peritonitis is contra-indicated in the cases of general acute miliary tuberculosis; it has also proved to be of no avail in examples of

acute miliary tuberculosis limited to the peritoneum. In subacute and chronic forms, operation has been attended with good results. In cases of generalized peritonitis the best results have followed simple incision, without either flushing or drainage. The cases treated by irrigation show 72.5 per cent of cures; those not irrigated show 74.3 per cent of cures. Drainage is not necessary.

The statistics of Roersch, which present 358 operations: Of these, 20, or 5.59 per cent, died as the result of the operation, 51 died a few weeks later of other tubercular trouble, and 250, or 70 per cent, were cured; 118 were kept under observation six months or more, 79 a year, and 53 two years longer.

THE CLOSURE OF THE ABDOMINAL INCISION AFTER LAPAROTOMY.

By A. T. McCormack, M. D.
Bowling Green, Ky.

In this period of recent surgical development, when safer and simpler operations per vaginam are rapidly displacing most abdominal operations on women, it may strike the Society, at first glance, that a study of the methods of closure of the abdominal wound after laparotomy would be of little value. However little one may realize it after listening to the average gynecologist, there are still many operations which are not in their purview, and the general surgeon still has numerous opportunities for incisions in the abdominal wall and their subsequent suture. For this reason I have had very little hesitation in selecting my topic, and, while I may add little that is new on this important subject, I hope to present a practical plan and show its simplicity and effectiveness.

Let us first consider the structures that enter into the abdominal wall. These are skin, subcutaneous fat, muscular tissue, one or more layers of fascia, subperitoneal tissue, and peritoneum. The ideal aim of the surgeon in closing an incision through these tissues is to restore their normal relations. As this ideal can only be reached approximately, I shall take up each of the structures separately and consider how the continuity of each may be most easily and most completely restored.

In every aseptic incision through the peritoneum its retracted edges should be brought into immediate apposition by a continuous suture of fine catgut. This serves a twofold purpose, viz: the prevention of infection of the cavity, if, as unfortunately

will happen occasionally, some outer portion of the wound should become septic, and the prevention of infection of the line of the incision from within. It may be denied that the latter can occur without a septic peritonitis, but every observer who has seen through-and-through stitches used to close incisions after laparotomy must have seen such cases. It seems to occur after this fashion: A small colony of pathogenic germs that would be destroyed by phagocytes from a normal peritoneum settles and develops in the gap which will be left between any two stitches put in by the through-and-through method. Such a colony develops in the non-resisting subperitoneal tissues under most favorable circumstances, and rapidly invades other structures, within and without, whose resistance has been lessened by the traumatism.

Muscular tissue is only resistant in the line of direction of its fibers. An incision or a separation along this line demands no suture usually, as the suturing of adjacent structures, aided by the functional activity of the muscle itself, will bring the edges of the divided muscle together. If the incision has been made elsewhere than in the median line, and muscles have been divided transversely, the ends should be brought together by numerous buried interrupted sutures of chromicized catgut or kangaroo tendon. Wherever it is possible McBurney's simple plan of dividing the fibers of the different muscles, instead of incising them, should be adopted. While this plan was devised for appendectomies, it is applicable to almost every celiotomy where the incision is not in the median line.

Then, if the muscular tissue is resistant in only one axis, what abdominal wall structure supplies its place in the other axis and prevents hernia between the fibers of the muscles? It must be evident that the fascia, composed of dense interlacing strands of connective tissue, whose elasticity is slight, must be our main dependence in the restoration of the belly wall. If after operation the apposition of the fascial edges is so accurate that there can be no beginning of a pouting of abdominal structures out-

ward, there can be no hernia. Whether absorbable or non-absorbable materials should be used for these sutures is a mooted question, and is probably immaterial, good authoriries adopting each plan. Whatever material is used, whether silkworm gut, silver wire or catgut, the interrupted stitches should always be placed close together. I have preferred Harris' procedure and used chromicized catgut or kangaroo tendon, because either of these is ultimately completely absorbed, and I introduce four sutures to each inch of incision.

Unless pressed for time a running suture of fine catgut, as suggested by Kelly, should bring the edges of the subcutaneous fat together. This is more important if this layer is very thick. Such a suture takes but little time and obliterates a space which frequently, in the old procedure, became filled with a clot which subsequently broke down from surface infection.

The skin is so elastic that it is of little use in the prevention of hernia, but its careful suturing is of the utmost importance, not only from the prevention of infection but in order to make a sightly scar and not too long to delay convalescence. One of the most important practical lessons of the surgical bacteriologist is that the staphylococcus epidermidis albus is rarely, if ever, entirely removed from the skin by whatever method of sterilization has been adopted. Have we any method of bringing skin surfaces in such perfect apposition that the danger of infection from pus-forming bacteria in the skin is minimized? Marcy or Halstead or both have answered the question with their subcuticular stitch. This is simple, easy to apply after a little practice on the cadaver, takes but little time, and, if catgut be used, there are no stitches to remove. The scar left is a slight linear one, and after a few years is practically obliterated.

To summarize, I would say that the most efficient method of repair of the abdominal incision would consist of the following distinct steps: (1) A continuous peritoneal suture of fine catgut, (2) an interrupted suture of chromicized catgut for the fascia with four sutures to the inch, (3) a running suture of cat-

gut for the subcutaneous fat, and (4) a subcuticular subcutaneous stitch of catgut for the skin.

Of the necessity for this or some similar method of tier suture there can hardly be a question. The time should have long since passed when any surgeon would use the old through-and-through suture unless his patient be in such danger of collapse that haste was a necessity and hernia and infection a secondary matter. I have heard even noted surgeons, after using the old method for years, say that they themselves had never had a hernia following one of their laparotomies, nor a stitch-hole abscess, nor a serious adhesion, nor a contracture of gut. Such statements can only mean that some noted surgeons do not keep their patients' history after the operation and immediate convalescence are passed; but such accidents have happened within the experience of every general practitioner, and the surgical history of nearly every county in this or any other State would be incomplete without a record of one or more such post-operative accidents, the result in almost every one of them of the use of the through-and-through suture.

DISCUSSION.

Dr. W. H. Wathen, Louisville: I hardly know what to say upon the subject that has been so briefly and so scientifically presented by Dr. McCormack. The method he has described of closing the abdominal wound is certainly as good as any I have heard described or read of, or that I have practiced. It is impossible, it seems, to get a consensus of opinion as to what is the best method of closing the abdominal incision. There are, as he says, noted surgeons to-day who will use a suture through all the wall. The interrupted suture, silver wire, silk or silkworm gut, sometimes even chromicized catgut, are used. And I must agree that there are many cases where the union has been made by these methods and there has been no future trouble, and the results have been as perfect as it is possible to have them. In these instances the results will not be good unless the fascia is pulled well out and the suture is introduced on the angular projection on which we have the fascia. However, in order that we may get

the best results, I think the better plan is that described by Dr. McCormack. I am glad to see that he suggests the interrupted suture for the fascia, because if you use the continuous suture you will often have suppuration far beyond your expectation. You will compress the tissue more at one point than at another, and therefore you will have tissue necrosis from strangulation. This is obviated by the use of the interrupted suture. One of the prettiest methods of uniting fascia and muscle that I have seen is that used by Dr. Marcy, of Boston, in which he uses the kangaroo tendon. I assume that chromicized catgut would do just as well. He threads one suture after the other, and when he gets through he has absolutely even pressure at every point, and he never has suppuration and always obtains perfect union. After that he completes closing the wound by subcutaneous suture of the fat, if there is much fat present, and then he concludes it by running a suture through the skin just above the wound, and then introduces it just under the surface from one side to the other until he has brought the entire wound of the skin in apposition with the wound. Then he has the suture emerging half an inch below the wound, and it is perfectly smooth. He then covers it over with iodoform collodion, and puts over the wound only a few fibers of cotton to give it strength. He uses no binder. He pursues the same treatment in hernia, and all his cases recover very well. I endorse what the doctor says in reference to hernia following abdominal operations. We find it in the practice of men who do good work. For that reason I agree with Dr. McCormack that whenever this work can be done by the vaginal route, that is the better course to pursue.

HYGIENE OF VISION: READABLE PRINT.

By William B. Meany, M. D.
Louisville, Ky.

Under the above caption it is proposed to deal exclusively with normal visual capability, for I am convinced that a brief inquiry into this subject will be calculated to do good service by directing attention to very important questions which must be of great practical interest to the human race both in this and future generations.

Until our study halls are much more methodically ordered than they are now, popular sentiment had better be educated to understand that the present outlook for ever-increasing visual defects and physical degeneration among our school children is an exceedingly gloomy one.

Vision should be looked upon as a physical capability, just as well fitted to be recognized as a point of merit as our daily exercises, such as bicycle-riding, walking, running, indulgences in field sports and indoor gymnastics; and, no matter what excuse may be made for the practice as a part of our school system, it is unjust to require the same amount of close visual or mental application suitable for robust children of their nervous or feeble companions, for it can find no sanction in medical circles. Schools should be provided with a dynamometer for testing muscular insufficiencies of each pupil.

Notwithstanding the utter disregard by municipal authorities of all advice by physicians upon questions of public hygiene, there is a cry coming from the school-room demanding in no uncertain tone the opening up of a neglected field of usefulness, which will absorb profitably the energies of at least one third of

our present membership, whose possible extent and usefulness to the community can not be overestimated.

Is it not exceeding the ordinary bounds of reason or justice for the public any longer to expect physicians, merely because they are more humanitarian than people of other avocations, to devote their time and talents for the education of salaried officers of municipal government boards in hygienic and sanitary science without any recognition whatsoever for such services, to say nothing of financial remuneration or even so-called fame? At the apogee of our boasted nineteenth-century enlightenment we are confronted with hygienic and sanitation attempts by unenlightened individuals, or worse, a barbaric ignorance and a reckless indifference to the laws relating to health and to human life.

Full acquaintance with the rich literature of modern hygiene and sanitation should be required by law of all persons seeking election as school trustees, or appointments on school boards, and a rigid enforcement of examination on these subjects by a competent and non-political board of examiners to render applicants eligible for positions as superintendents or as teachers in the public school service.

Imperfect light, bad print on highly-calendered paper, impure atmosphere, faulty ventilation, overheated and crowded schoolrooms, unwholesome water supply, lack of suitable recreation halls and grounds, and too long-continuous study hours impair muscular tonicity, so necessary to keep up eye-tension for acute visual requirements.

It is not the purpose of this paper to discuss errors of the refractive apparatus of the eyes, so often brought about by the stubborn persistence of school boards and others in following a medieval "system" of school hygienics; for when errors of refraction exist, without the adoption of suitable prophylactic or mechanic measures for their correction, it places the eye at a corresponding disadvantage and precipitates all the sooner a failure of clear and comfortable vision, and oftentimes with results disastrous to sight.

School buildings should be located to secure the best sanitary environments and light—the northern light wherever feasible. The windows should be numerous, large enough, and so arranged as to give ample daylight to every part (and corner) of the room. The windows should be provided with what is known to intelligent architects as the single sash window. The window space should be at least one fourth of the floor space. There should be no more space between the top of the windows and ceiling than is required to finish the building, and the window-sill should be four feet from the floor. The light should be arranged so as to fall upon the pupil from the left, or left and back—never from the front.

There should be suitable curtains (not wooden slat "blinds") of a gray or buff color for the windows—two to each window—hung in the center of each window, so that either the upper or lower half, or both, can be perfectly shaded. The walls should be of a light gray or buff color with non-reflecting surfaces.

The question of properly fitted desks and seats is a very important one, as children often acquire a pernicious habit of "crouching" while at work, bending their heads forward close to the desk, thereby putting a great strain upon the accommodative apparatus of the eyes with resulting compression of the superficial veins of the neck and corresponding congestion of the head, which may lead to the development of myopia, or even more serious complications.

The height of the seats and desks must correspond with the length of the pupil's legs below the knees. They should be fitted to the pupil each year. The seat may be horizontal or slightly curved. The back should be formed of a lower convex and upper concave portion. A desk for writing should have an inclination of about fifteen degrees.

The subject of caligraphy is one which might still further engage the attention of school boards and teachers' associations. Vertical writing can be taught with about half the trouble and

acquired in one half the time requisite for oblique writing. The latter, conjoined with ill-fitting desks and seats, is a frequent cause of myopia, round shoulders, and other maladies from which school children suffer.

Blackboards should be placed opposite windows—never between—and should be of a dark, lusterless color, kept scrupulously clean, and not made gray with chalk.

Lessons placed upon the boards for pupils to copy are injurious to the eyes, by reason of the rapid change of focus required from the distant board to the paper on the desk, hence they should be avoided. For sanitary reasons the use of the deadly sepsis-generating slates should be abolished from the schoolroom.

When blackboards are used for object-lessons they should be placed at a distance of not less than fifteen, or better, twenty feet from the nearest pupil, for beyond this distance the rays of light from the object to be looked at are brought to a focus upon the retina and produce a clear image with the minimum effort or strain of the accommodation on the part of the normal (emmetropic) eye, and it would be best to divide the class into such a number of pupils as can be placed directly in front of separate boards.

All work placed upon the blackboards must have a certain minimum, that the area of each letter will correspond to the square of a visual angle of five minutes (one twelfth of a degree), so that the letters should be distinctly read by the pupil at the greatest distance from the blackboard; say at forty feet, letters should approximate one inch square; at twenty feet, one half inch square. By the adoption of this plan a "rough-and-ready" test can be made by the teacher of the visual acuity of each pupil, so that any student failing to "make out" all the letters with each eye separately, of the size and at the distance mentioned, is almost certain to be suffering from some error of refraction, or a more serious complication requiring immediate medical attention.

The question of the size and form of printing type, the color of the material for the background, is not only of great imporance to the comfort of adults, but is of far greater importance to children. What constitutes readable print? The most readable print is that by which one may obtain the maximum of reading with the minimum injury to sight. It is first necessary to have a clear idea of the word "readable" as applied to the impression of type. Letters upon paper can be read without fatigue only when there is a marked contrast between the letters and the ground. This contrast may be of tone, of color, or both.

Contrast of tone is the most favorable condition for distinct vision, if we consider white and black as the two extremes of a scale, comprehending the gradations from normal gray; in fact, black letters upon a white ground presents the maximum contrast of tone, and may be read in a perfectly distinct manner without fatigue in diffused daylight. Indeed, all those whose sight is enfeebled by age require the maximum contrast of tone.

The word "tone" of a color is here employed exclusively to designate the various modifications which that color, in its greatest intensity, is capable of receiving from white, which lowers its tone, or, from black, which heightens it.

The language of science is only conventional, and its uniformity alone makes it intelligible in all times and in all places, without which we ought to mention the condition under which the examination of the central visual acuity, as well as that of the periphery, has been made, and the test of the "sensibility" of colors. The light we employ to supply the place of the sun changing the relation of colors under which the same bodies appear to us illuminated by daylight, it is evident that if we neglected this difference of relation it would give rise to error, because any assortment of colors favorable to be read in diffused daylight might be less so by artificial light; therefore we will put aside the most desirable of all paper, the pale brown (creamy hue), or the paper recommended to reduce the contrast of tone, having a brownish or slight yellow hue when the deep black printer's ink is

used, for there are some mechanic difficulties attending the perfect execution of toned papers, as well as that of expense. All are, of course, familiar with the effect produced by the utmost contrast of tone—that of black print with a satinized (glossy) light-reflecting white paper, giving the greatest stimulation of the retina, and consequent fatigue.

More important factors, perhaps, in the readableness of print than tone or color of the ink and paper are the size of the type and its corollary, length of line (not to exceed four English inches—100 millimeters), which may seem of little importance to the general reader.

The popular prejudice in regard to the double columns on a page would be untenable were it not that the same economy which restricts the amount of space also reduces the size of the type and crowds lines together. A double column which is properly printed and divided is most certainly preferable to the same amount of matter extending in a single line across an entire page.

It has been accepted by oculists that type embraced by an angle equal to five minutes is the smallest printed matter which can be recognized by the average normal eye. According to this formula, the smallest print a normal eye can readily distinguish at a distance of one foot is about one fiftieth of an inch; at eighteen inches (the average distance at which a book is held by an adult) the smallest recognizable type would be about one thirty-second of an inch. The normal eye should never be subjected, for any length of time, to a type smaller than twice this size; that is, one sixteenth of an inch. The fact, however, that spectacles are now so commonly used removes in a degree, by restoring the focalizing power, the necessity of a larger type than this after middle life. Too coarse print, such as "English" or "pica" type, is wearisome to the eye, as it requires more exertion of the rotator muscles, which govern the movements of the eye, that is, for a given amount of matter; and especially is this

the case when the breadth of the page is, as it usually happens, increased so as to keep a just proportion of the matter on a line.

The type must be of a size to maintain a just relation between the length of the line and the ideas to be conveyed by the printed matter, but not so small as to require an effort to decipher it; and these lines must not be long enough to cause fatigue by undue use of the rotators of the eye.

No print is readable enough to preserve the sight of those who, in defiance of fixed natural laws, subject their eyes to a greater or longer strain than that to which the animal economy is adapted.

Resumé. Eyes, muscles, and brain must all have a fair chance, and no one sacrificed to the other, if we are to have an enduring race; and, as this appears to be impossible in our present school system, one is led to have rather a poor opinion of our institutions as they are now conducted.

Until our school system provides the necessary aids by which the act of vision is performed, the accommodative apparatus refuses to work in a normal way.

Official statistics, the results of examinations made by competent investigators in all parts of the world, conclusively prove what an important bearing the question of light and ventilation *alone* has upon the health of school children, and discloses the fact that "nearsightedness" increases with the attendance on schools.

For reading: (1) heavy-faced type (say "long primer" or "small pica"), in contra-distinction to light-faced, properly leaded, with wide spaced (interlineal) lines, should alone be employed.

(2) A dead-faced white paper (with non-reflecting surface) has considerable influence upon the ease with which the act of vision is performed, and therefore should be preferred.

(3) A light, almost imperceptible yellow (creamy), tint paper is recognized as the best—that known to paper-makers as

"natural tint"—from the fact it contains no dye whatever, and has been bleached only to a moderate degree; it has the color of unbleached cotton cloth. This paper, however (being made from the best of linen material or waste), is expensive.

A likely substitute, made from woodpulp or straw, can be had in some of the second-class papers, having a modified brown or slight yellow (creamy) tint, with a dead (non-reflecting) surface, at a moderate cost.

DETACHMENT OF THE RETINA.

By Dudley S. Reynolds, A. M., M. D.
Louisville, Ky.

Detachment of the retina has been the subject of more varied experimental methods of treatment than any other disease of the eye, not even excepting acute glaucoma.

My purpose in introducing the subject is to invite attention to what seems to me an altogether neglected part in pathology, and to illustrate the value of purely medicinal treatment in some forms of displacement, which I can not believe were really, either of them, cases of actual severance of vital connection between the retina and choroid.

If we are to understand that the term "detachment of the retina" is used to designate both the instances of complete severance and those of displacement merely, we are in a position at once to comprehend the conflicting accounts of the results obtained from both medicinal and surgical treatment.

The character of detachment reported by Prof. Robert L. Randolph, of Baltimore, in which he found fibrillar degeneration of the vitreus, with constant shrinkage from contraction of the altered vitreous body, and proportionate detachment of the retina from the pulling of it away from the choroid as the bundles of fiber underwent contraction. The origin of the radiating fibers which remained after complete degenerative change in the vitreus seemed to have been in the retinal substance. Says Dr. Randolph: "In conclusion, then, the most striking anatomic change in these two cases was the fibrillary degeneration of the vitreous body, a condition which I think is found more or less in every case of retinal detachment, and which probably is the chief element in the pathogenesis of the disease."

Dr. H. O. Reik, Dr. Randolph's assistant at the Johns Hopkins Hospital, regards forty to fifty per cent of all cases due to choroido-retinal changes, common in high degrees of myopia, often produced by some slight and otherwise unimportant traumatism. He concludes: "The seat of the lesion is probably the blood-vessels, leading to edema of the retina, producing delicate folds in the membrane, which may remain a long time before complete detachment. In other cases the walls of the vessels have undergone sclerosis, and suddenly give way, leading to subretinal hemorrhage and consequent mechanical detachment."

Whether subretinal effusions from the choroid ever cause detachment is a mooted question.

I believe all the causes of traumatic displacement are associated with rupture, and those which go on to complete detachment of the whole retina are very likely, at the beginning, pushed away from the choroidal surface by the pressure of the vitreous humor through the laceration in cases where the vitreus is already fluid; and in some cases serous effusions, constituting an irremediable edema of the retina, which brings on that state of degeneration in the vitreus described by Dr. Randolph, and which fairly well accords with the theory of Nordensen and Leber. It must have been the condition of things in those cases reported by Deutschmann, successfully treated by emptying the vitreous chamber of its abnormal contents, and afterward injecting the cavity full of freshly prepared aseptic vitreus from young rabbits, diluted with three-fourths per cent of common salt. "The first experiment of this sort was made February 4, 1894. April 28th vision $=\frac{17}{200}$, and in July it was $\frac{17}{70}$, equal to Jager No. 3. Up to May, 1895, he had treated seven eyes in six persons, obtaining in four of the seven eyes results that hitherto would have been regarded as impossible." He considered them cases of total or complete detachment. Before the treatment central vision was, in every case, limited to the bare perception of light and shadows. Some inflammatory reaction followed

each injection, and in those cases which were most obstinate the treatment was repeated, and in one case three injections were made.

Whatever may be said in favor of punctures, counter-punctures, wire and catgut setons, no such brilliant results have followed any other form of surgical treatment; but, like every other character of uniformly successful treatment, there are a large per cent of cases in which it is wholly inapplicable.

I have seen cases of apparently complete detachment following lacerated wounds of the walls of the globe, accompanied by large evacuations of vitreous humor, in which entirely complete recovery followed. It is claimed that more than two per cent of all the cases of detachment of the retina recover spontaneously. Surely these cases must have been cases of mere displacement and folding of the retina from temporary edema, concussion of the globe, or the sudden loss of a large amount of vitreus through a rupture in the walls of the globe. In fact, all displacements merely, which are due to causes which may be removed, but which are of necessity of but temporary duration, afford a sufficient variety of causes to explain the brilliant results obtained from the various methods of treatment, as well as the comparatively large number of cases which recover spontaneously.

In explanation of the causes of retinal displacements and detachments, it has been too often observed that authors have aimed to set forth a single theory, which in itself is sometimes untenable, and the argument employed to support it is an idle waste of words.

Deutschmann's results are little less than startling. I have, however, two cases to recite which hold out, to my mind, reasonable hope of permanently successful results from medicinal treatment alone.

In the two cases which I have selected for illustration, advanced inflammatory changes of the choroid and retina had already occurred. In one case no myopia was present. In each case one eye was saved.

In the case of Mr. C., aged forty, who had perception of light merely in the right eye, irido-cyclitis had set in. It was still possible, however, to illuminate the fundus, and what appeared to be complete displacement or detachment of the retina was easily made out. He described the shadows of all objects as being silver-tinted. He returned to his home, sixty miles distant, after my first examination, and I did not see him again for two days. At his second visit, October 7, 1889, he no longer had perception of light in the right eye; the pupil had been allowed to contract, and posterior synechia formed. In the left eye the field was extremely limited. Sight $= \frac{20}{L\ x}$. (Fig. 1.)

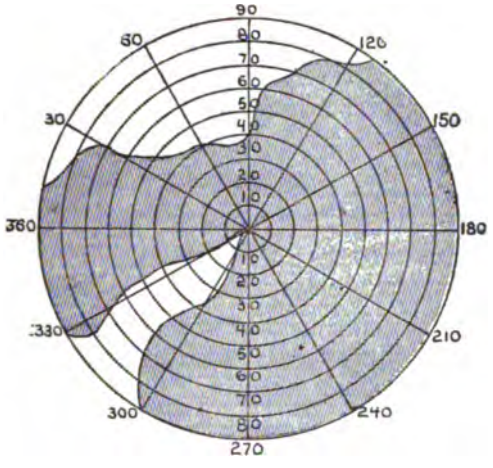

FIG. 1. MR. G. C., OCTOBER 7, 1889.

The patient's general health was impaired; he was anemic, and had been the subject of recurring attacks of arthritis. He remained ten days in Louisville for treatment. He took aperients every morning on arising. For the first week he took one-twelfth grain of muriate of pilocarpin in a half-pint of water every three hours, followed immediately by a cup of malted milk. He wore smoked glasses and remained in the infirmary, being forbidden to go either up or down stairs. On October

25th his sight had advanced to $\frac{20}{L}$. The pain, which had been distressing in the right eye, had entirely ceased. He was allowed to visit the office. From this time on he took three grains of iodid of potassium in a half-pint of water every four hours, alternately with one-sixteenth grain of muriate of pilocarpin. He steadily improved under this treatment until November 7th, when he had no further signs of irritation in either of the eyes.

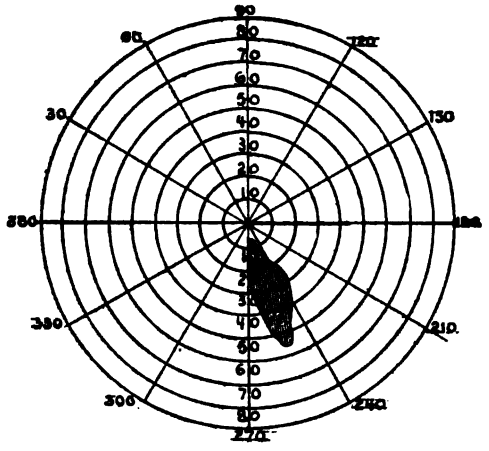

FIG. 2. MR. G. C., NOVEMBER 7, 1889.

(Fig. 2.) The displaced retina in the left eye had seemingly resumed its normal position and appearance. He saw with $-\frac{1}{12}$ axis 90° $\frac{20}{xxx}$ Snellen. On May 16, 1893, sight $=\frac{20}{xx}$ in the left eye; the right eye, still remaining free from irritation, was totally blind. On the 19th of January, 1899, I saw him in most excellent health. He now reads the finest type without difficulty. He is a merchant, and attends to his business daily without inconvenience.

The second case, Mr. L. K., aged about fifty, on September 7, 1896, came with hemorrhagic choroido-retinitis. The field of vision in the right eye was limited to the inferior temporal quadrant, with a small area of perception in the horizontal portion

of the nasal periphery. In the left eye the field of perception was limited to a small portion of the periphery in the inferior nasal quadrant. A recent hemorrhage had occurred in the macular region, all around which existed complete detachment. (Fig. 3.)

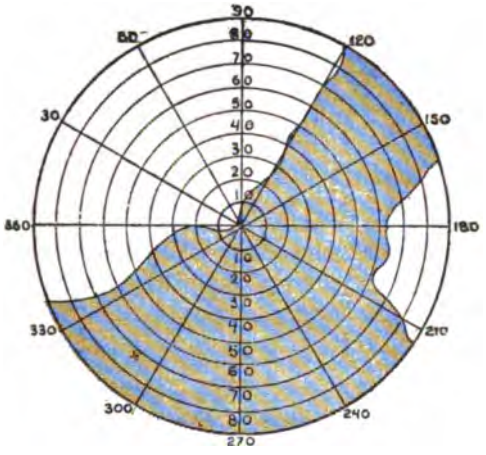

FIG. 3. MR. L. K., SEPTEMBER 7, 1896.

The patient was given one ounce of rochelle salt in a pint of water, to be taken immediately, and sent to the infirmary with instructions not to ascend or descend stairs. He was provided with dark smoked glasses, and allowed fluid food only. He complained of no pain. He was thin in flesh, but not anemic. He was directed to take one-twelfth grain of muriate of pilocarpin in a half-pint of water every three hours, followed immediately by a half-pint cup of fluid nourishment. On the 7th of September there was no longer perception of light in the left eye, but the condition of the right eye had vastly improved. On the 11th of September he had good central vision, with sight equal to $\frac{6}{vi}$, without the use of glasses. He was permitted to return to his home, with instructions to make no use of his eyes, and to take two grains of the iodid of potassium in a pint of water every four hours. He continued in this way until October

3d, when he was apparently well. The displacement of the retina in the right eye could no longer be detected at any point. (Fig. 4.) In the left eye displacement was limited to

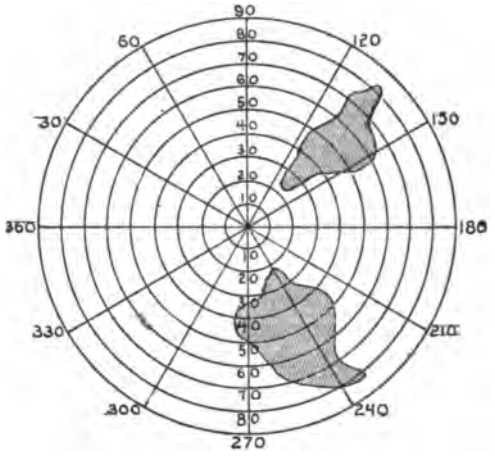

FIG. 4. MR. L. K., OCTOBER 3, 1896.

a small area in the macular region, where light shreds floated freely from the surface of the choroid into the vitreous chamber. The optic disc at this time appeared to have undergone complete atrophy, and numerous dark pigmented spots of various size and form occupied the whole retinal substance. Mr. K. remains in good health, with normal vision.

FRACTURED BASE, WITH DEAFNESS, TINNITUS, VERTIGO, EXOPHTHALMOS, FACIAL PARALYSIS, MASTOIDITIS: OPERATION AND RECOVERY.

By J. A. Stucky, M. D.
Lexington, Ky.

The following case is presented on account of its peculiar interest from an etiological standpoint, as well as its uniqueness and rarity:

F. T., a jockey, aged 21. On March 15, 1899, while exercising a horse under a shed the animal reared, throwing the rider against the rafters, striking his head with such violence that he was thrown from the horse to the ground. He was unconscious for only a short time. Dr. J. M. Allen saw him shortly after the accident, and reports that there was a large contusion of the scalp, covering the top of the head, which was rapidly followed by edema, extending down to both ears, more marked on the right side. He complained of great noise in his right ear, some deafness, and was very restless.

There was no hemorrhage from nose or ear. The patient says he "spit up a few mouthfuls of blood." The scalp was shaved and an ice-cap applied; ten grains of calomel given; also an anodyne to relieve the restlessness. A week later he became very deaf in the right ear; this was followed by facial paralysis of the same side, great tinnitus, and vertigo.

I saw him for the first time five weeks after the injury was received. He presented a dazed, listless appearance, with considerable bulging of the right eye (exophthalmos), with several hemorrhagic spots in the deep conjunctiva and some dimness of vision.

Ophthalmoscopic examination was negative. His temperature was 101° F., tongue coated, pulse 72. There was complete paralysis of the right side of the face, almost no hearing in right ear, swelling of the soft parts covering the mastoid, with marked tenderness over the tip and the antrum.

The auditory canal was red and swollen, the posterior superior wall bulging. The membrana tympani presented a gangrenous appearance, being of greenish-black color, with small laceration in the superior posterior quadrant, through which exuded an offensive amber-colored fluid. His mind is sluggish, and he complains of constant headache, fullness and roaring in ears, and inability to sleep. There was some aphasia; gait unsteady; speech difficult, at times incoherent.

I concluded from the symptoms and the history of the case that this condition of affairs was the result of a fracture of the base of the skull. The middle ear was filled with clotted blood, and the ear symptoms, headache, and facial paralysis were the result of pressure within the middle-ear cavity and antrum, accompanied by a periostitis and general inflammation of the drum cavity. Opening the mastoid, with a view of doing the radical operation (Stacke-Schwartze), was decided upon as being the most rational procedure for removing the exciting cause of the trouble.

On the following day I operated at the Good Samaritan Hospital. An incision longer than is usual was made from below the tip of the mastoid to one-half inch or more above the linea temporalis. The usual method of doing the radical operation was adhered to. After separating the soft parts and bringing the field into view, I found the membrana tympani so infiltrated and disintegrated that nothing short of the Stacke-Schwartze operation would accomplish any thing. This was accordingly done. The entire mastoid was opened. The periosteum was much thickened and very vascular; the antrum and cells were filled with firmly adherent blood-clots; no pus, no evidence of necrosis. The attic and middle ear were also filled with clotted

blood, but there was also evidence of inflammation and disintegration of the contents. The malleus had separated from the drum, and the incus from the stapes, and were hanging in the cavity imbedded in the firm clot of blood. After removing the clots and inflammatory products the parts were washed first with hydrogen dioxide, then bichloride solution 1 to 3,000; the membranous canal was brought into place and retained by tubular tampon, made of iodoform gauze strip, and the mastoid wound dressed in the usual manner.

On account of the extreme hardness and density of the outer layer of bone and the great depth of the antrum and pneumatic cells, the operation was tedious, consuming one hour and ten minutes. Notwithstanding this, the patient was put to bed in good condition. The following day his mind was clear, and all disagreeable symptoms had disappeared except the facial paralysis. His recovery has been uninterrupted. On the fourth day he was up and walking through the the corridors of the hospital, and in one week discharged from the ward to be treated as an out-patient.

"WHAT CAN WE DO FOR THE CHRONIC INVALID?"

By Curran Pope, M. D.
Louisville, Ky.

In May, 1897, the writer presented to this Society the third paper of a series upon the above subject, and in which he insisted that great strides had been made and much good could be done in the treatment of the constantly growing classes that he termed "chronic invalids." It will not be amiss to state here again that "in no sense of the word can chronic disease be distorted into meaning incurable disease, for a very large percentage are capable of entire relief, and of the remainder there are very few indeed that can not be so improved as to render their lives useful and far from suffering." I divide chronic disease into three classes: first, the nervous; second, the gastro-intestinal class, and third, the metabolic and nutritional one. The first class was subdivided into numerous nervous and mental diseases, and to-day I desire to bring to your attention some concrete examples of one of the commonest of all chronic diseases—neurasthenia—and embody some of the theories and practices spoken of in that paper in a concrete rather than in a general manner. Many new observations have been made since the paper was written, and the same will be embodied in the observations made upon the cases herewith presented.

Mr. ——— (935), age twenty-six years, single, by occupation an architect and superintendent, has been for the past three and a half or four years in bad health, gradually losing ground and becoming incapacitated for work. Five years ago he began at long intervals to have attacks of despondency. For a year these troubled him considerably; at the end of this time the attacks were very much more frequent, as often as one a week, when

the climax was suddenly reached three years ago when he ruptured a blood-vessel, as he describes it, with the result that a small hemorrhage of the lungs occurred, though this did not worry him much, as his family never had consumption; nevertheless it recurred to him whenever he had discomfort in the chest. Since then his symptons have been gradually but surely getting worse and worse, and he attributes his condition to the hemorrhage and overwork. He is a man five feet ten inches in height, and weighs 165 pounds; a dark brunette, sallow, well developed and muscular; has always led an active life, and has rarely been sick in his life. Investigating his case, I find that his father died when sixty-six years of age, having always been healthy. His mother died at the age of forty of some nervous disease of which he does not remember the name. One brother living is healthy, but his two sisters are both delicate and very nervous. As a child he suffered from the usual children's diseases, having had measles, scarlet fever, whooping cough, and, at the age of sixteen, pneumonia. Since the attack of pneumonia he has suffered from migraine, which has recurred more frequently since his health broke down. At the present time he suffers from extreme weakness and the feeling as though he were toppling over; his head feels light at times, and when he is the least excited a sensation of choking passes over him, extending even to the legs, that then shake and tremble, and he is unable to use them for a short time afterward; his head feels as large as a bushel basket, the scalp is tender to the touch; he has pain just above the eyebrows, is excessively tremulous, easily excited and upset, and rarely sitting still a moment. He is excessively morbid, and has had morbid dreads for quite a long time, these dreads taking an hypochondriacal form with regard to his having heart disease; he lives in constant apprehension lest he should have paralysis or locomotor ataxia. Mentally he is much depressed, and can rarely shake off the sense of depression and oppression. In health his spirits were bright, but now he can not enjoy those things that formerly interested him; gradually his memory has failed, and his powers

of concentration are lessened; for this reason he is unable to follow his occupation, and says that he can not originate any new ideas, which are very necessary in his profession. For the past three years he has had gradually increasing insomnia, and now sleeps only with the aid of beer or some drug; during the past six months, and at the present time, he suffered intensely from attacks of lumbago and intercostal neuralgia. If he feels well for a little while and attempts to do any thing, physically or mentally, he gives out at once and all of his symptoms are very much aggravated; when he does any work it is with a sense of working under the lash, and he constantly realizes that he will "pay up" tenfold for what he has done. His appetite has been variable, and he is a rapid and imperfect chewer, assigning as a reason for this that he is too nervous to eat or do any thing slow. He has had trouble with his stomach for the past two years. When he eats a moderately fair meal he begins at once to suffer from great discomfort, becomes depressed and gloomy, and in the course of an hour, the stomach becoming very acid and filled with gas, cardiac palpitation sets up, adding to the constantly growing heaviness, weight, and oppression. He states that if he does not eat he becomes so nervous from emptiness that it nearly drives him wild, and if he eats he has the symptoms above described or the old ones aggravated and accentuated. Constipation is always present unless lienteric diarrhea intervenes. He suffers from shortness of breath and difficulty of respiration; the skin is cold and clammy, the extremities cold, the nails blue and pale, while alternating hot flashes and chilly sensations add to his discomfort. He has had hyperidrosis for the last three years, and states that he has given up every idea of ever recovering his health, but is willing to make a last effort to do so if any hope could be held out to him. Physical examination showed him to be finely developed; heart normal; pulse 92, small and of high tension; lungs healthy, but the respiration small and deficient; abdominal contents normal, except for aortic pulsation; reflex excessive. For the past year he has used no liquor or tobacco.

Examination of the blood revealed:

Hemoglobin, 60 per cent, Fleischel test.
Corpuscles, 4,000,000.
Blood placques, scanty to absent.

Polynuclear neutrophiles,		84
Mononuclear leucocytes,		1
Lymphocytes	"	13
Transitional	"	1
Eosinophile	"	1

A few free nuclei; rouleaux poor; color pale; crenation quick; showing a marked anemia with leucocytosis of polynuclear. The *urine* was as follows: Spec. grav. 1034; acid; color, reddish amber; urea, 1½ per cent; phosphates in excess; albumen, a trace; no sugar; indican and indol; peptones; microscopically, uric acid and oxalate of calcium crystals in excess; epithelium, pus, few spermatozoa; no casts or renal derivatives.

The above case presents a chain of circumstances leading up to the general breakdown. At the age of sixteen, after an attack of pneumonia, he suffered a severe breakdown and began to show his weakened nervous system of developed migraine. Four years later, under the stress and the strain of heavy work, his present condition gradually developed. After a thorough talk with him and the laying down of hygienic rules, he was placed upon a combined course of massage, electricity, and hydrotherapy, with the result that at the end of seven months he was so far restored that at my suggestion he went to the country, where he remained for sixty days; since then he has been at his work without interruption, and during the past year has had no return of his symptoms, his appetite and digestion being good, sleep regular, and the entire functions of the body naturally and well performed. At my earnest solicitation he has become a total abstainer from liquors, beers, and tobacco.

Miss A. (930), age twenty-three years, has been sick for the past eight years. Seven or eight years ago the trouble commenced as an indigestion, and since then she has been gradually but slowly declining in health until her present state was reached. Her family history is as follows: Her father is sixty-two, and has been healthy except for a rheumatic trouble which he has

had for the past twenty years. There is consumption in his family, two of her uncles having died of this disease. Her mother is living, age sixty, also coming of a tuberculous family. She has three brothers, one of whom is healthy. One other brother has had melancholia of the mild type, from which he recovered, and the other brother has been afflicted with morbid dreads for a number of years. Two sisters are healthy. As a child she was very strong and robust, and tells me that she has never had any of the children's diseases except measles; that up to seven years ago she was in perfect health, and never knew what a pain or ache meant. At that time she had an enormous appetite and ate great quantities of food, consuming as many as five meals a day. During this time she lived in the country and was taking a great deal of exercise, and as a result did not feel the effect so perceptibly at the start. Six years ago, when she came to Louisville, the indigestion became much aggravated, owing to the fact that she was employed in a large millinery store, and as she could get no open-air exercise, she began to grow nervous and listless; lost her color and some flesh; was unable to sleep or even rest comfortably at night. At this time she took a great deal of medicine, and had resorted to a large number of hypnotics to produce sleep. She had very peculiar feelings, as though walking on the tips of her toes, peculiar mental ideas would come to her, an example of which she gave, as follows: "If I see any one peeling an apple I feel like I am an apple or must peel one." She had a mortal dread of a knife, razor, or any edge tool, and so great was this condition that the sight of a knife would produce visible goose flesh. As a rule she can force herself to work, but the minute it is over she goes all to pieces and is utterly prostrated. While she is in this state the breathing is very rapid and the muscles of the neck feel tight and drawn, she becomes very emotional, the tears well up in the eyes, and she trembles from head to foot. She complains of a sense of pain in the head, as though some one were boring an auger in the top of her head; the slightest thing upsets her, and when she is

nervous her mind is apt to become at times perfectly blank, and she is unable to concentrate her attention upon any thing. The least bit of excitement will so prostrate her that she will be unable to walk for several hours afterward. She suffered from a dull, heavy headache constantly day and night. Her sleep is limited to about three hours a night, and is filled with terrible dreams; she awakes unrefreshed; occasionally she will sleep five hours a night. She is melancholic, and rarely ever feels comfortable or happy; she can not work or do a single thing in the household duties without having one of her attacks. Physically she is strong and the muscular system well developed, but the least exertion causes fatigue and prevents her accomplishing any thing she starts out to do. She suffers from palpitation of the heart and extreme shortness of breath. Her digestion is still good, but she has learned that indulgence in food causes such great discomfort that she has limited her eating to reasonable amounts. Even now a light meal will cause oppression, weight, gaseous eructations, palpitation, increased headache and nervousness, owing to the amount of food taken. She has lost comparatively little flesh; she is a large, well developed woman, well nourished, blonde, though her complexion is pale and pasty; she is intelligent, and describes her condition with great clearness; is easily keyed up, and becomes emotional upon reciting her suffering or her condition. Physical examination showed the heart to be normal, pulse 84, temperature 98° F., and respiration 20. Her pulse is but little increased by movement or excitement. I saw her in one of her attacks when the pulse was 40. Her reflexes were excessive, and under repeated testing would diminish. The examination of the blood resulted as follows:

Hemoglobin, 50; corpuscular count, 3,850,000; blood-plates scanty; leucocytosis of polynuclear variety; rouleaux poor, corpuscles pale, free nuclei, and crenation rapid.

Examination of urine revealed trace of albumen, excess phosphates and chlorides; indican; peptone, and indol; large quantities of uric-acid crystals, pus, and epithelium; no renal derivatives.

Examination of stomach contents by the quantitative method of Hayem and Winter resulted as follows:

Total acidity,	.188
Calculated acidity,	.187
Total chlorine,	.260
Free HCl,	.020
Combined chlorine,	.180
Fixed chlorides,	.110
Co-efficient of albumen digestion,	.87
Co-efficient of fermentation,	.90
Co-efficient of solution,	.90
Co-efficient of absorption,	.72

For the past five years she has had great menstrual pain during the first two days. Three years ago she had the os uteri dilated by a leading gynecologist without relief. She menstruates five days, and after the first two days merely suffers heaviness, weight, and discomfort locally, but nearly all of her nervous symptoms are increased during this period.

Under the use of electricity (static), mechanical massage, hydrotherapy, and nux vomica she began to show improvement slowly, but the morbid dread of every thing was so great that I felt it was materially interfering with the progress of her case. I therefore hypnotized her, with the consent of her family and in their presence, with a result that far exceeded my most sanguine anticipations, being able at the end of eight treatments to remove the mental state heretofore described. The remainder of the treatment was carried on for five months, at the end of which time she was discharged entirely well, and has since remained so, although having been subjected to one or two severe nervous strains sufficient to have produced a relapse.

Mrs. C. (946), of Kentucky, age fifty-two; married; three children, all of whom are healthy. She gave the history of a gradual but steady decline in health for the past six years. Seven years ago she commenced to have malarial chills, and at once placed herself under the care of her family physician. From time to time she was subjected to large doses of calomel and quinine, and other "strong medication," which resulted in

producing an indigestion so severe that she has never been able to eat with any satisfaction since. One year ago she became very ill, and at the end of two months was in the condition in which she now is. On April 18, 1896, she was brought to my sanatorium unable to walk and confined to the bed. I obtained the following history:

Her father died of pneumonia, and had been a healthy man all of his life. Her mother died of measles. She has four brothers in fair health. Her three sisters are very nervous, and have weak digestions. A paternal aunt of hers died of consumption, and one of cancer. The family is an exceedingly nervous one. She complained of intense muscular weakness constantly present, and from which she was never free, no matter what she did, the slightest exertion causing trembling and twitching in the muscles, and if she became excited she was prevented from sleeping at night by sudden jerks in the lower limbs. There is always present the sense of fatigue, and she never feels any of her old-time vigor. Headache is present constantly, and increased by mental or physical effort, or by the slightest excitement of any kind. It is vertical and occipital, accompanied by the unpleasant feeling of retraction of the head; the spine is very tender, and she complains of constant soreness or backache between the shoulders, in the small of the back, and in the loins. For the past two years she has suffered from chilly sensations, and has been exceedingly nervous and restless. She complains especially of the sensation of tightness or contraction around the chest, of general numbness and vague pains and aches in the lower limbs; she has a sensation of pressure over the heart. If she takes medicine to relieve her she is at once prostrated and can do nothing. Owing to her weakened condition she has taken considerable whisky as a stimulant. For the past year her pulse has ranged from 80 to 150, and frequently intermits. The slightest exertion, even rising from the bed, will cause the pulse-rate to reach the latter figure. She is very short of breath, and fears her trouble may bring on asthma. Her

appetite is poor and irregular; she is a rapid eater, and her digestion is practically nothing. She lives entirely on beef tea and whisky. If she were to dare to eat a fair-sized meal she would be utterly prostrated with pulsation, palpitation, nausea, vomiting, and would require five to six days to recover. She is obstinately constipated, and uses enemas constantly. She claims she never sleeps more than fifteen minutes at a time, and rarely gets over two hours sleep a night. She has a feeling as though a band or constriction were around the waist, and for this reason has feared ataxia. She has passed the menopause. Her mental state was simply pitiable, lacking capacity to do any thing at all, neither being able to sew or read for one minute at a time. It is with difficulty that she concentrates her attention upon any thing, and it is hard to obtain a clear account of her case. Frequently she will say, "I can not think." From having been a woman of courage and independence who was afraid of nothing, she has become morbid, nerveless, and introspective, fearing death and every thing possible to fear.

The physical examination showed her to be five feet six inches high, to weigh 120 pounds in poor and soft flesh; sallow skin, dry and harsh; pulse 140; lungs normal; heart rapid, no murmurs, but intermitting every seventh beat. Her reflexes are active. The examination of the blood showed hemoglobin forty per cent; placques scanty; corpuscles 2,880,000; leucocystosis; free nuclei, rouleaux poor, color pale; no bacteria.

The urine showed reaction acid; spec. grav. 1020; slight trace albumen; phosphates in excess; indican, indol, and peptones; uric acid and oxalate of calcium crystals, epithelium, pus, and cylindroids; no renal derivatives. I was unable to give a test-meal, owing to her weakened condition. The sputum was examined very carefully, but showed no casts or crystals pointing to asthma. No tubercle bacilli present.

It was such an unpromising case that an exceedingly cautious prognosis was given. She was kept in bed and given cold sponges, abdominal packs, manual massage, the full pack at bed-

time, a more generous diet at frequent intervals, and *no medicine whatever administered.* When the pulse-rate became too frequent an ice-bag was applied with happy results. At the end of six weeks she was able to occasionally get up, and gradually to resume walking; as she increased in strength and flesh the treatment was made more active, and rain baths, jet douches, faradism, galvanism, mechanical massage, and open-air exercise were introduced, with the result that at the end of only six months she was entirely restored, and has remained in excellent health since then. I have seen her three or four times in the last two years, and have heard from her from time to time. The cure has been perfect, without the slightest tendency to relapse.

Miss D. (955), age thirty-eight years; single; a housekeeper, but of late years has been unable to do any thing whatsoever. Seven years ago—in 1892—when the severest form of grip was prevalent, she had an attack lasting for three months, and since then has been surely but steadily declining in health. The onset was very gradual, and only from time to time has she noticed that she could not do things as she formerly did. She became gradually more nervous, depressed, and irritable until about three years ago, when she became totally incapacitated, although able at times to get up and go about, but has recently been compelled to spend most of the time in bed or on the sofa or in an easy chair. Two years ago she was brought to the sanatorium in the condition to be hereafter described.

Her family history shows that she comes of an arthritic and nervous family, her brother having had neurasthenia, two sisters suffering from migraine, and one brother being of the nervous "temperament." She has suffered from the usual diseases of childhood, and after the onset of puberty she began to develop headaches of a migrainous character, which gradually increased in frequency until her thirteenth year, but since then they have been less. She has had at various times attacks of what has been diagnosed as uric acid but would recover and for a while feel better. She complained of great muscular weakness, and for the last

seven years has had rigors of the lower extremities, which were followed by purplish mottling, distension of the veins, and extreme coldness to the touch. When she has these attacks she breaks out in a cold perspiration, and becomes very morbid and fearful of death.

One of the most persistent of her symptoms is the sense of constant fatigue, unrelieved by any treatment that she has adopted. Ever since the beginning of the illness she has complained of backache and vague, unlocalized pains in the spine, which, upon examination, was found to be sensitive and tender, especially in the cervical region. Since her migraine has ceased she has been subject to a dull, heavy, tired headache, located in the frontal and occiptal regions, greatly increased by effort. Accompanying the headache is a sensation of pressure or boring at the vertex. Hot flushes occur many times a day and increase the general nervousness from which she suffers. Her hands and arms become numb and tingle on the slightest provocation, and when this feeling passes off there is a sensation of soreness left behind. The slightest exertion physically will bring on an attack of palpitation of the heart with shortness of breath, giddiness, and vertigo. She constantly has sensations as though there was a pressure or flowing away of the entire abdomen. Her appetite is poor, irregular, and fickle. She is a small but exceedingly rapid eater, and has never masticated her food properly; as a result her digestion is greatly upset. If she eats any thing, in twenty minutes she will feel as if the meal was of lead, the weight and pressure greatly increasing, and in the course of an hour the accumulation of gas will be so great as to lead her to believe that impending suffocation is at hand. Accompanying this is intense palpitation, rapid pulse, great irritability, depression, and coldness of the extremities. After two or three such meals she is apt to have a vomiting spell, with the result that a great deal of the food of the past twenty-four hours is vomited undigested. The intestinal tract is loaded with gas, and constant rumblings are present. For years she has suffered from

a torpid and inactive liver and obstinate constipation. Menorrhagia has been present for the past four years, and at times dysmenorrhea. At the present time the periods occur every three weeks and are extremely prostrating, lasting from five to seven days, with excruciating pains and a great increase of her nervous symptoms. The mental condition, as in these cases, was surely pitiable. She could not recount her symptoms without breaking down and crying, and the slighest ache or pain seemed to open the flood-gates. Any attempt at mental action was certain to produce an aggravation of every symptom mentioned, her depression almost amounting to melancholia. There were no delusions or hallucinations, and she seemed to realize fully her condition. The insomnia was persistent, and she made the claim, which I afterward verified, that she did not average two hours sleep in the twenty-four. All these symptoms during the last eight months had been greatly aggravated by the stomach trouble.

Physical examination showed a tall, thin, and angular woman, weighing one hundred and twelve pounds; sallow, dry, harsh skin; slightly deaf and suffering from asthenopia, which had been somewhat relieved by the adjustment of glasses for astigmatism, prescribed by Dr. Cheatham. The heart and lungs were normal, although I found quite a number of mucous râles in the chest; the spine was very sore and tender, and the reflexes excessive. The abdominal contents were considerably displaced downward, the level of the stomach being three inches below the umbilicus; the colon was distended, and considerable gurgling was noticed all over the intestinal tract; no hemorrhoids were present. A very careful and thorough examination of the gastric contents by the quantitative method of Hayem and Winter showed her to be suffering from hypopepsia with hypochlorhydria and acid fermentation. Gastric dilatation was also present; the renal secretion was scanty and high colored, and had a specific gravity of 1030. The phosphates are increased; there is a trace of albumin and peptone; indican and indol are markedly present. Microscopic examination shows great excess of uric acid and oxalate of cal-

cium crystals, together with epithelium and pus-cells; no casts are present. The blood was found to register forty-five, and corpuscle count showed four million two hundred and fifty thousand, with a leucocytosis present, especially of the polynuclear variety. A diagnosis and classification in such a case would fit many niches, but the whole case could be compassed under that of the chronic invalid, and the case was so construed, a diagnosis, however, being made of neurasthenia, complicated by gastric dilatation, hypochlorhydria, anemia, and uric acidemia. The case could have been treated from twenty-two different standpoints. This statement is made with a view of emphasizing the necessity of treating a case as a whole and not based upon local or faddish methods. She was put to bed, the diet carefully regulated, stomach washing instituted, and a strong moral control taken. She was shut off from communication with friends and relatives. By the use of packs, faradism, and the galvanic current, together with proper nursing, she was able in six weeks to be put upon an active course of treatment, consisting of rain-baths, douches, mechanical massage, faradism, and gentle but regular exercise in the open air. Five months of such treatment placed her in such a condition that she was able to go to the country with advantage for a month, after which she returned to her home, and has for the past fifteen months remained in perfect health, attending to all her duties at the head of quite a large household. Three or four days ago I saw her; the gain in flesh, color, and spirits continued, and she expressed herself as a thoroughly contented as well as healthy woman, in whom every function seemed normal.

Neurasthenia or nervous exhaustion is a functio-nutritional neurosis without demonstrable organic lesion, characterized by neural enfeeblement and irritability. The symptoms produced by the disorder are multitudinous, and involve every organ and tissue. Its principal symptoms are:

1. *Psychic.* A state of mental morbidity characterized by a peculiar state of fear or dread; anxiety, distress, and morbid depression, varying in degree and character.

2. *Myasthenia or Muscle Weakness.* This symptom or group is accompanied by many and peculiar states of change sensation.

3. *Sensory.* This group includes general pains, especially in the bones and muscles (rachalgia), twinges, and tremors.

4. *Head Symptoms.* Made up of pains and aches, vertigo, and feelings of pressure, weight, drawing, tingling, numbness, coldness, etc.

5. *Insomnia.* Varying in degree, character, and depth.

6. *Digestive Disorders.* Of stomachic and intestinal varieties.

7. *Vascular Disorders.* In which palpitation, hot flushes and flashes, polyuria, and pseudo-angina play a prominent part.

8. *Sexual Disorders and Diseases.* In which dysmenorrhea, ovarian neuralgia, pelvic pains of nondescript variety, etc., and, in the male, impotence, seminal emissions, vesical irritability, and morbid sexual ideation are present.

9. *Physical.* In which we find loss of weight, changes in physical appearance, and exaggeration of the reflexes. The underlying conditions are dependent upon nutritional changes in the neuron; especially in the portion (the cell body) whose function is the conversion of the food pabulum into neural energy; the storage of the neural energy for future distribution. Denutritional states in the nervous tissues favor speedy and irregular neural response. This disease is mainly one of the period of greatest activity of adult life, when functionation and the laborious struggle of daily life cause the greatest stress Males and females, in my experience, are equally affected, and celibates less so than those maritally burdened. The Semitic and American races furnish the largest contingent. Few causes act singly, and a careful investigation of all cases will show that numerous factors act together to produce this disorder. Six main causes will practically cover the field; these are:

Heredity. In this category we find many cases present the history of nervous troubles in the direct or collateral branches of the family. My experience has been that mental disease in one generation is very apt to produce functional disease of this

character in the next, while the same interchangeability relates to the tubercular. Consumptive parents transmit to their children unstable nervous systems, whose equilibrium is very easily upset, and who develop this trouble under slight causes. The so-called lithic diathesis is much more prone, in my experience, to produce types of gastric and vasomotor type.

Patients handicapped by this burden start in life with their nervous systems vulnerable, and their equilibrum is so easily upset that in nearly all cases that present hereditary entailment we will find that a long chain has existed from infancy, leading up to the final giving down of the nervous system in neurasthenia. Neurasthenia is much more the individual than one would be led to believe, and, individually studied, we find that he who has the weak foundation of an irritable nervous system will acquire the disease. Go deeper and you will find that the child had teething spasms, headaches or convulsions, and later chorea, and when puberty is reached migraine is apt to develop, and thus from one step to another during the developmental life a chain of neuroses is forged.

2. *Mental Worry.* We may work and even overwork often with impunity, but it is the work, the struggle, and the strain that is carried on with the added burden of worry and anxiety that sooner or later breaks down the most robust constitution. The mother burdened with children, whose cares and welfare are a constant drain, who is frequently, especially in the artisan classes, subjected to the worry of a drinking husband; who is constantly fretted by household cares and financial pinchings, is the woman who quickest develops the disease. The social dame, whose increasing duties demand of her business work, social care, much loss of rest, and irregular living, likewise is prone to succumb. The business man who worries with all the details of daily transactions, who struggles under the burdens of life, who is crushed by financial panics, is apt to be found among this constantly growing class. It is astonishing how many men have been seeking health from nervous breakdown since the great

house of Baring Bros. closed its doors in 1893, a blow the world felt. In addition to all this, many of the sufferers had to carry the anxiety of providing for a family. My attention has been strikingly called to a class of men apt to have this trouble, namely, those who promote large schemes and who are subjected to unusual strain and care in the presentation of their interests.

3. *Overwork.* Overwork of itself has, in my opinion, had to bear the burden of a great many of these cases, but few cases come to us who can really and truly lay to the door of overwork alone the cause of their troubles. Too frequently we find that it has been overwork under emotional strain, with worry and anxiety attendant features. Overwork is too frequently favored and a stage of breakdown fostered by having resort to alcohol at these times. Alcohol blunts the sense of fatigue and enables one to carry on work that he would not otherwise be able to do, but it is a work carried on entirely at the expense of the vital force; too frequently do we see students break down under the coupled or associated strains of a social life and hard study; likewise it is too much for the female attending a higher education to couple with it social pleasures or duties running far into the night and despoiling her of that which is necessary for the storage and retention of force for the day's work, namely, sleep.

4. *Improper Living.* In this class we find that the resident of the city is largely the offender; we live in the city largely by our brains and our nerves, and usually success is measured by the amount, character, and quality of brain-work. Too often we find that persons in city life are too sedentary, too closely confined, too intent upon acquiring through their brains independence and success, without due regard for the dangers and for the after-consequences that might occur; improper clothing, illy ventilated offices, crowded rooms are conducive to nerve strain and nerve wear, while the open-air life of the country is more productive of stronger nerves than the city; but even to-day in rural life we are beginning to find that this disorder is constantly

cropping out, owing to the competition and strain upon a class that has hitherto been largely free from such troubles.

5. *Abuse of the Digestive Organs.* This factor is much more potent than we would believe, and I am constrained to say that there is hardly a man or woman in a thousand that is not overeating, when their work and muscular capacity are considered. He or she who would live long and be free from nervous troubles must eat sparingly and carefully, fewer meals and lighter ones, paying due regard to simplicity and moderate satisfaction of the appetite than stimulation to overeat. Nearly every case coming from the rural districts presents digestive disorders as a prominent basis on which to work. In the city, clerks and business men generally seem to think that ten minutes for dinner and thirty minutes to pick their teeth is about all that is required, and in that short ten minutes is swallowed a meal, imperfectly chewed, poorly subdivided, and capable of causing intense and terrible subsequent suffering.

6. *Sexual.* In the female we find nearly always a disturbance of the menstrual function, the predominating troubles being dysmenorrhea and menorrhagia with irregularities in menstruation, ovarian neuralgic and nondescript fugitive pelvic pains. These conditions are nearly all dependent on the general nerve state.

In the male the frequent presence of seminal emissions adds to his gloom and may keep up the state. Relaxed and cold genitals, slight urethral discharge, prostatorrhea, a true spermatorrhea may be present singly or together. Masturbation, *in presente,* or its terrifying influence as a past factor should be kept in mind.

My experience has been that alcohol and tobacco are not very potent causes of neurasthenia, and in fact in very few instances can causal relations be traced. Tea and coffee likewise more likely produce local symptoms, gastric affections. Nor are these remarks to be construed in any sense as a defense for or an attempt to justify the use of these narcotics and stimulants.

Their influence is baneful, and they possess wonderful and potent activity for the causation of disease in other organs of the system, but are rarely causative factors in neurasthenia.

The treatment of this condition can be divided into eleven heads, which I here name in order of their importance, according to my experience:

1. *Moral Control and Discipline.* Neurasthenia is so often met, is so well known and so often diagnosed, that carelessness is apt to crop out in regard to study or individualizing each case, and, as I have said before, as neurasthenia is individual, so individual study of the case brings about the best results. Too often patients are told: Oh, you are only nervous, or, you have neurasthenia, which expression seems to satisfy the physician; to be followed by the advice that the proper thing to do is that the patient should control himself and not dwell upon his symptoms; he is advised to take a vacation and get a nice rest, or is given a routine prescription, often hastily written, and told to call again. This I consider the veriest nonsense. Neurasthenia is a grave and sufficiently serious disorder to be handled with as much care, consideration, and circumspection as the most serious ailment. The very fact that it is a *serious disease and curable* should make us more than ever careful. To this end moral control is absolutely essential. It is a disorder that requires a deeper, keener, and truer insight into the understanding of mankind, or womankind, for that matter, than any other bodily or mental disorder. A mastery of the entire Materia Medica and a brilliant application of its resources is of little or no value. The mental status of the patient is such as to require as much treatment as his body, sometimes more. I have found few cases in which the mental ailment is not predominant, in which it has not been severely taxed and strained, and the multitudinous phases that the mind manifests during the duration of this disorder are like the strains and variations of a harp of a thousand strings, and require a peculiarly trained personality who can, who must, and who will exercise a control over the patient, kind, gentle, but

firm as steel; who will help him over his difficulties, assuage his terrors, and relieve his sufferings. The morbid fear, tangible yet so intangible; the mental depression, impalpable yet so palpable; the constant, minute, and never-ending self-inspection; the magnification of each and every symptom, significant yet insignificant; the anxiety never ending, and the realization of incapacity and impotency constantly growing, invests the patient as an army does a beleaguered city. His constantly growing fear of further helplessness, the terrors that the persistent and insistent sleeplessness causes, the physical restlessness and hopelessness arising from failure upon failure to obtain relief pushes the patient into a state of morbidness that baffles the power of language to describe. How often can we trace the anguish, the suffering, and the hours of torture that have been the outcome of the thoughtless statements of the medical advisor; and were we always to realize the peculiar state in which these cases are, I am satisfied that we would be very cautious and careful not to intensify the already existing or growing morbid state.

The moral control of the patient is largely a matter of personality. Confidence is usually inspired by the knowledge that one is a useful and successful physician, but this confidence can be greatly increased and our control maintained by a very careful and thorough examination of the case and by increasing our knowledge of the peculiarities and phases of mental make-up of the individual patient. Those patients do best who are perfectly obiedient to the physician's command, and who are sufficiently interested in their own case and in their recovery to make his expressed wish their law in action, and, as far as possible, in thought. Firm management of a case does not at all imply harshness or overbearing on the part of the physician. Firm management is thoroughly consistent with tactfully urging here, restraining there, but yet keeping all well within his grasp, and, if necessary, firmly but gently forbidding what he knows to be bad, and insisting upon what he knows to be good for the individual case. Cheerfulness should be inculcated and nothing is so inspiring as

example, so that cheerfulness on the part of the physician is very likely, by contact and example, to induce a like state in the patient. No physician can control nervous cases who has not first become "greater than he that takes a city" by gaining that control over himself that is essential to impressing others. Hope may spring eternal in the human breast, but with the neurasthenic it is not always so, and the physician can frequently induce a hopeful state in the patient by carefully pointing out improvement that has taken place and inculcating hope of recovery and improvement of symptoms based upon a thorough knowledge of the particular individual and case in hand.

The moral control of a patient is never thoroughly satisfactory or perfect as long as he or she remains in the same environment and associations. Few physicians seem to realize the subtle and peculiar influence of association, and, as these cases are all in a receptive state, it becomes very important to sever them from such relations and surroundings, and to produce the most favorable impression upon them they should be brought directly under the control of the physician's personality. Where this is impossible, and where the patient is an office consultant, it is wise to as far as possible remove such factors as tend to perpetuate unpleasant associations or weaken that *en rapport* that should exist between them. My experience has been that, in order to achieve the very best results within the shortest possible time, we should remove the patient from his home and surroundings to some well-conducted institution where every provision is made for the reception and treatment of his case. By this means we accomplish much. He leaves a sympathizing family, is at once bereft of that solicitous and officious friend who is constantly advising him, and the less experience and the less knowledge the friend has the better he seems to think his advice. At one stroke he is removed from among those who indulged him in his selfish acts and deeds, and is brought to a standstill by the realization that he can not and will not be permitted to tyrannize as he has heretofore done. Few physicians realize how unhappy the aver-

age neurasthenic can make a household with his selfish views and self-centered ideas. The moment he is removed he is kindly but firmly controlled, and this removal seems to establish more healthy ideas. In the course of a decade of experience I have had many say that this course would drive them mad, and they seem to dwell upon that fatuitous idea that their peculiar constitution, their physical make-up, and their mental attributes are such that they can not possible do as others do, nor follow out the course suggested, and they argue warmly upon the subject and try to convince you of the absolute needlessness of such a step. Permit me to say, gentlemen, that when such an argument is presented there is double reason for compelling the patient to take such a step. I have had a number of instances in which isolation has brought a quiet rest and peacefulness, together with freedom from business cares and household worries, that was far beyond the dream of the patient, being better for him and far better for his family. The added advantages of such an institution are at once apparent when we stop to recall that, in addition to the rest that can be imposed and demanded, we have the constant stimulation of nutrition and elimination which are the foundation stones of a perfect restoration to health in this disease. The more I practice among such cases the less do I adopt the strict rest cure, but prefer to partially isolate my case and require him to rest in the quiet of his room three or four hours a day, preferably after treatment and the ingestion of food, allowing him to get up late in the morning and compelling him to retire early; each case requiring especial modifications suited to the peculiarities of the individual.

Our moral control can be increased by a strict avoidance of lying, and no physician can retain the control of nervous individuals who is constantly making them promises and breaking them. Patients should further be controlled from preserving symptoms and sufferings upon little scraps of paper. I require always an immediate cessation from such doings, as it merely serves to recall the symptoms and suffering and intensify both.

In this connection we should be very careful to explain to the patient that neurasthenia is a chronic trouble, that it is of long duration, and that few cases recover in a short time, but that by persistent treatment, careful and close attention to the details outlined by the physician, a resolute obedience to his demands and wishes, will be productive of the desired result. It is for this reason that we refuse those cases who come to us after months and sometimes years of suffering and say they will try the treatment for thirty days; with me they are never given an opportunity to pass judgment on the means adopted or on my ability as a physician.

2. Neurasthenics must be taught health laws, but usually when they reach a specialist they have learned by hard knocks and sufferings such general health instructions as every intelligent individual should know; but where there is any question concerning their lack of knowledge in this direction they should be told of the need for proper ventilation of their rooms, and that regular hours should be maintained for rising and retiring, and particularly for their meals. The physician should outline to them the needs of their case, and give them hints and rules for exercise, trying to select some such form as will confer open-air exertion with pleasureable occupation. Neurasthenics nearly always have dried up nerves, and should be told to drink freely of water internally, and that there are many advantages in its external use. Regular hours for stool are absolutely necessary, and this should be insisted upon. In the general consideration of hygiene I consider the need for sleep, and, as ninety-five per cent of all the cases suffer from insomnia, it becomes very important to secure this element of physiological rest by such general laws and treatment as will produce the most natural and lasting results. My experience has been that the general treatment adopted for the neurasthenic state will most frequently overcome the insomnia, and that the combination of massage, hydrotherapy, gymnastic exercises, and rest will be sufficient. Where we have them under our control and can compel a great deal of

resting in the prone position it will be found that patients do not require the amount of sleep that is generally believed to be the quota of those who labor; but should we find that the adoption of general measures is not sufficient, we can, after a little while, and after the patient has refused to respond to the mechanical measures, supplement this by the use of sulphonal or trional.

3. *Dietetics and Feeding.* Neurasthenics may be divided into three classes dietetically speaking: first, those who are placed upon a general diet with very few restrictions; second, a gastric group, in which an analysis of the stomach contents has distinctly pointed out the need of a dietary; third, a special group, embracing those taking the full rest treatment. Dietetics have suffered from more fads than any other portion of therapeutics, and in the broad range of this subject we will find more folde-rol and foolishness than in any other branch of medicine. In this disorder, I firmly believe, more patients have been upset and distinctly injured by dieting than in any other disorder known. The keynote of the whole treatment is rest and feeding, and after an experience with no inconsiderable number of patients under nearly all conceivable conditions—clinic, hospital, out-door, sanatorium, public and private practice—has led me to the firm conviction, strengthened by a daily growing experience, that a general, liberal, mixed diet is the diet par excellence for the neurasthenic, and that when we restrict the diet beyond few articles we do a positive injury to our patient, unless the analysis of the stomach contents has shown undisputed evidence of such disorder or disease as to at once preclude the liberal diet here considered. Barring such gastric cases, we should give the fullest and broadest dietary possible, such as the following: Soups, meats in moderation, cereal foods, rice, sago, cracked wheat, oatmeal, peas, beans, potatoes, spinach, greens, string beans, butterbeans, celery, crisp lettuce; bread, dried or toasted; zweiback, graham bread; butter, buttermilk, milk, cream, cottage cheese; moderate use of puddings, not too sweet; ice cream; stewed fruits and many raw ones. I have found that under the use of the mechanical methods, to be

hereafter described, patients can eat liberally of the above diet, where it is well cooked and carefully chewed, with impunity. I constantly urge patients to satisfy their appetites as if they were healthy, with the result that they suffer less from stomach symptoms than they did before a free dietary was instituted. This condition of affairs will materially assist in overcoming the atony of the intestine. I constantly insist upon the free drinking of large quantities of water, and have seen unmistakable good results follow. Where there is but a slight deviation from the normal gastric state, as shown by an analysis, it is best to ignore the difference and keep on a full and generous dietary, trusting to the mechanical measures and general treatment to correct the slight gastric error; but where we have to deal with a true gastric disorder or disease, unmistakably evidenced by an analysis, we will find that it is usually a myasthenic condition or a dilatation with a hyperpepsia or a hypopepsia, and these conditions must be met by local supplementary measures and as liberal a diet as possible, instituted in addition to the general and persistent treatment of the main disease. If we can institute measures, however, that will relieve the local gastric condition, we will find that such relief is often a great help and encouragement to the patient and assists materially in relieving the cruel oppression from which the patient suffers. The bowels must be most carefully looked after, and if the increased diet, the liquid ingested, together with the general treatment, is not sufficient, then laxatives must be given. Where no organic disease is present, the most important measure is the general treatment of the disease here enumerated. Where we are compelled by the disease of the stomach to decrease the quantity of food, this should be promptly increased and added to as soon as possible and a strict diet avoided. It is often advantageous to administer milk in some form, and this in addition to a full regular diet. We can frequently aid the patient by knowing his gastric digestion, and in a hyperpepsia by adding soda to the milk, or in a hypopepsia, sterilizing it. I have found Dr. Buckley's suggestion of a warm glass of milk before meals of

great service, rarely interfering with the appetite or digestion of the patient, and frequently increasing it. Where patients suffer from emptiness between meals, the warm milk may be given while they are resting, or cream toast may be used. Emptiness and lack of food often make many cases miserable.

4. *Hydrotherapy.* The use of water as a remedial agent in the treatment of neurasthenia can hardly be overestimated, although some writers will hardly agree with me in the entirety of this statement. I rank it as the first and most important and essential of all the physical remedies on which I am prone to rely in the treatment of this disease. I have rarely found any agent equal to it in its capacity to produce destructive katabolism and further retrograde metamorphosis followed by reconstructive anabolism. No known agent will produce such powerful and rapid stimulation of the surface and deep circulation of the body; its action in elimination is as important as its constructive influence. It makes a powerful impression upon the peripheral nerves, and, by its countless reflex effects, sedates and tones the entire nervous system and produces after its application a feeling of well-being and strength to which these cases are usually strangers. Reaction is always to be aimed at, and where this is thoroughly obtained the pleasurable feeling and stimulation resulting upon such an application serves as a great encouragement to the patient and helps to restore to him a confidence that he has not heretofore possessed. With the equalization of the blood circulation comes relief of the unpleasant head feelings, nervousness, and mental depression, and oftentimes following its application is a restful desire for sleep. Under its vigorous application the muscular pains and sensitiveness of the skin disappear for a short while, but under constant application remain permanently absent. Its influence upon bodily functions is marked, waste products being rapidly eliminated and toxic material rapidly removed from the system; it increases the appetite, stimulates the digestion, increases intestinal action, and enhances greatly assimilation. By its overcoming the annoying and irritating pares-

thesia it favors slumber and repose, and thus enables the patient for a while, at least, to exercise that control that we are endeavoring to instill into his mental make-up. For the successful treatment of neurasthenia fully equipped hydriatic apparatus is necessary, and this is one of the reasons why the institution is of such advantage in the treatment of this disorder; the applications that are often most useful in such cases are the cold ablution, the dripping sheet, the half and full pack, the hot and cold spinal sponge, the hot-air cabinet, the electric light bath, the rain bath, the spray, and the douche. Many cases who commence the water treatment have often to be educated to these procedures, starting with the simpler applications and gradually rising to the stronger and more revulsive treatment. No patient, no matter how weak or delicate, but can take them, and with no inconsiderable experience. I have rarely found a case of this trouble that was not directly and immeasurably benefited by the use of this agent. In many cases we start with the ablution and pack, or with a very gentle rain-bath of a rather high temperature with but slight reduction. As the patient grows stronger we may lengthen the time and lower the temperature, or change to the stronger spray of using the powerful jet douche. One of the best methods of producing the changes enumerated is to give the patient an electric-light or hot-air bath until sufficient heat is accumulated on the surface or until prespiration has set in, after which he is quickly and promptly removed to some stimulating application, such as a rain-bath or douche, which is applied at a temperature of from 100 to 106 degrees for a moment or two, and then rapidly reduced to from 85 to 55 degrees F. The patient is then quickly dried, well rubbed, and, depending upon the case, rests for a certain length of time or takes exercise in the open air. If the reaction is prompt and efficacious, the temperature is reduced from day to day. In many cases undergoing the rest treatment the opening procedure in the morning is the application of the dripping sheet so well known to all of us. A wet sheet wrung out of water from 85 to 65 degrees F. is

quickly thrown about the patient (standing on a warm surface or in a hot foot bath), and then the attendant makes rapid friction for from a half to two minutes through the sheet, which is quickly removed, the patient dried, and friction again applied until reaction takes place. No application that I know of is more effective in the production of sleep than the full pack applied carefully and scientifically, and in which the patient remains from thirty to sixty minutes; the temperature of the pack ranges from 60 to 90 degrees; when this is applied in the evening it often produces a good night's sleep. The hot and cold sponge to the spine may be substituted or alternated with the pack in our endeavor to obtain a good night's rest for the patient.

5. *Electricity* has and always will play an important part in the treatment of neurasthenia, although in my opinion it is a secondary one. That this method of treatment produces powerful effects, physically as well as mentally, is now beyond the question of a doubt; that it has a sedative influence upon the patient, that it favors the restoration of disturbed function, that it equalizes the circulation and improves the nerve tone, restores nutrition and relieves many of the annoying paresthesiæ, is a fact daily observed by those who use the agent. Four forms are ordinarily employed: the static, galvanic, faradic, and sinusydal. Were any one to attempt to describe the properties of any one of these currents in this article would require as much time and space as is allotted to me for this entire paper. In the static current we find a powerful relief for the muscular pains, the nervousness, restlessness, and head discomfort so prevalent; heavy sparks to the painful points, up and down the spine, together with the use of the head breeze and insulation, has given me the best and most satisfactory results. Where great muscular fatigue and exhaustion have been present, the faradic and sinusoidal currents have served well to relieve this state. I have succeeded by the use of the latter in producing sleep when all other remedies had failed. In my hands the galvanic current, when carefully and conscientiously used, controlled by rheostat and meas-

ured by milliampere meter, has served to produce sedative influence far beyond the ordinary.

6. *Rest.* In all schemes of treatment for this disease rest enters largely into the treatment and should play an important part. As I have said before, constant experience has taught me that the full rest treatment is applicable to a very small percentage of these cases, but that the best results are obtained by a modified rest cure, in which we allow the patient to stay in the bed until after breakfast, and require him to rest at frequent intervals during the day. Some cases are benefited for a week or two by constant rest in bed. Where such is the case, we utilize massage and resistive movements, together with faradism and the full pack, to improve tissue change. After the time is up the patient is gradually gotten on his feet and compelled to rest ten or twelve hours out of every twenty-four, the balance of the time being taken up in the schedule of treatment, embracing massage, hydrotherapy, and electricity. As he gets better he can exercise in the gymnasium, walk, ride, or fence, box, play billiards to pass away the time. The greatest question that one experiences is the amount of exercise the patient can take, and the safest and best criterion that I know of is the effect it produces generally upon the patient, rather than the temporary effect ascribed to it by the patient. Where we find that the exercise is increasing the appetite, improving the digestion, enhancing the circulation, and promoting sleep, we can take it that the patient is not overdoing; but should we find that there is produced increased nervousness, loss of rest, depression, increased tension and strain, then the exercise had best be given up for a short time, and complete rest enforced.

Exercise is always advantageous in the open air and should be so obtained, when possible, and the cases that are most benefited by the open-air exercise are those in whom sedentary life has played an important part. It has been my experience that where patients can get entertainment and distraction by playing backgammon, billiards, cards, or checkers, or can pass away the

time sewing, knitting, or embroidering, they should be allowed to do so, but restrained within such bounds as will not produce fatigue and cause them to worry.

7. *Massage.* Of all the mechanical measures suggested, massage is the least important in the treatment of neurasthenia, and yet can be made and does play a good part in any schedule of treatment. Like the two preceding agents, water and electricity, massage owes its value to its capacity to produce those changes of nutrition in the body and nervous system that result in better and more perfect metabolism. In the full rest treatment it plays an important part in overcoming the effects of enforced rest. As the writer has shown in a recent article (May, 1899), massage is easy of acquiring, and it is not necessary to learn a large number of flourishes and passes to make the application, but same can be applied by ordinarily intelligent persons. Massage operators are too apt to assert that the benefit lies in the peculiar method they adopt; but this is a mistake, and it is largely as above stated. The writer has found that mechanical vibration, or so-called mechanical massage, is far more valuable and useful in the treatment of this disorder. In my opinion it ranks favorably with electricity in its ability to produce extensive tissue change, relieve nervousness, pain, restlessness, increasing appetite, digestion, and assimilation.

8. *Medicines.* In the treatment of neurasthenia itself there is no medicine in the entire category that will cure the patient. There are a few that may be of service in symptomatic treatment. There is only one class of medicines that are measureably of importance in the symptomatic treatment or cure of the disease, and these are laxatives, at the head of which stands cascara sagrada, preferably in pill form; among the symptomatic remedies, the bromides stand at the head, and are much more used and more abused than any method of treatment. They should nearly always be combined with nux and arsenic. The main value of so many of the drugs given is the production of increased appetite that they produce. After considerable experience I have

learned the lesson that the vaunted value of pepsin and pancreatin is nil, and that frequently their use is detrimental; nor can we too forcibly speak against the habit that is frequently indulged in by neurasthenics of taking liquors to stimulate flagging appetite. I have never seen any advantage obtained from so doing that could not be obtained by a simple mixture of bitters. Hypnotics we use to simply tide them over until the patient can come under the full influence of the mechanical and general treatment of the disease.

9. *Local and Reflex Treatment.* There has of late years grown up a certain school that believe that this grave neurosis can be cured by the removal of certain local and reflex conditions, and they direct their attention solely and entirely to this end. We are shown cases in which the correction of ocular disease or the correct balancing of the eye muscles has resulted in a cure; or the relief of long standing gastric, ear, or prostatic trouble has resulted in complete and perfect relief, or where the removal of pelvic or uterine disease has produced marvelous results, or where the removal of a hemorrhoidal trouble has produced a like result; but all these cases hardly number 5 per cent of the vast concourse of sufferers. The concrete examples held up are too few to invalidate the rule we made, that neurasthenia is rarely, if ever, relieved by local treatment alone. Common sense dictates that a rational method be carried out, and to this end no one treating this disease would fail to relieve any local trouble that might exist, nor would he so far forget himself that when the local trouble was removed he would discontinue treating the true neurosis. It has been my uniform rule to as far as possible remove all causes of peripheral irritation, and thus lighten the burden under which the sufferer struggles. When this has been done, or while it is being done, general measures should be instituted for the relief of the true trouble.

10. *Climate and Travel.* We are frequently asked the question as to whether travel and climate are not of great value and

use in these cases. The writer has some very definite and clear ideas upon the subject, and they can be summed up very tersely. It has been my misfortune never to have seen a case benefited by a change of climate, and rarely to see improvement follow travel. The most absurd proposition for the neurasthenic to follow is the prescription, "travel for your health"; valuable time is wasted, chronicity induced, and recovery postponed, to say nothing of the discomforts and disappointments that follow upon such a course.

Surgery offers no cure or amelioration for the neurasthenic, and the pernicious practice once in vogue, but now rapidly dying out, of ablation of the female sexual organs was productive of great harm in a large number of cases, some of which it has been my misfortune to have treated. Do not let my brethren of the glistening scalpel be led to believe from the above statement that there is any attempt to belittle their noble art and science, but to simply say that such operations, without organic disease to justify their work, can not be condemned too strongly or too unequivocally. Once more permit me to state that it is largely the physician who cures these cases, and who takes the central figure in any plan or system of treatment; it is through his management, direction, and control that good results are brought about, and his results will, as a rule, stand in direct relation to his capacity to sustain and retain the confidence and control of his patient. The long tedium through which they both must go requires on his part a vast amount of patience, care, persistence, study, observance, and medical knowledge, coupled with a keen insight into the *genus homo*, that can only be acquired through long and trying years of experience. Full and thorough knowledge of the methods he uses are a *sine qua non*. He who would successfully handle these cases must be willing to devote his time and attention solely to this line of work, and it is a great mistake on the part of the general practitioner of medicine not to realize the useless fatuity of attempting to deal with this neurosis without the equipment and training so essential to their cure.

All in all, the physician must for once and for all time be the master of the situation and command it, and in proportion as he commands it will good results be the outcome.

As neurasthenia is so intimately associated in causal relations to heredity, it behooves us to so instruct the adult sufferer in the rearing of his children, that "as the twig is bent, so the tree may be inclined." That the present century shows an intense and constantly growing strife for success, when this is being measured by a monetary standard, and when social, economical, and political conditions have compelled every one to enter upon the intense struggle for existence or be swept along helplessly in the maelstrom, it behooves us to, as far as possible, start early to train the individual to bear the burdens and withstand the strains by building up a strong resistance and a firm neural equilibrium. If he inherits a weak and unstable physical or nervous organization, this is doubly needed, for he must have both. Those who are nervous must live so as to conduce to the best physical and nervous strength. Much care and caution should be exercised in the selection of a life partner, and marital relations properly and normally preserved. This would tend toward stronger progeny. Too great care can not be paid to pregnancy and the puerperium. From the hour of its birth the child should be watched and cared for. Every thing that tends toward that slow and simultaneous growth of body and mind should be sought. For many years the paramount necessity is the bringing up of the physical side. Precocious and "bright" children are poor children; every system physical must be well developed and brought to the maximum of development. An out-door country life, lots of fresh air and sunshine, grubbing in mother earth, physical exercise in all kinds of weather develops the physique and increases and enhances the reserve force for many years of strain. The most interesting child is the one who, with bare feet, patched trousers, dirty waist and dirtier face, knows every bird-nest or squirrel-hole for miles around; who falls in the creek and swims out or makes life an eternal and radiant song

by a bubbling merriment incapable of restriction or repression, whose cranium is stored with childish pleasures and nature's thoughts, rather than smart saying and tart speeches retailed to their elders' dismay. Mental education is essential, and without it nothing can be done; but in these children it is purely subsidiary to the physical. Plenty of plain, good food without gimcracks must be furnished. From early childhood bathing must be indulged in, and the cold bath is unequaled for the development of nerve and muscle tone, the hardening of the cutaneous surface, all of which remove waste, favor reconstruction, and increase growth. Boys and girls should early learn all the outdoor games and try to become proficient in them.

Luxurious life, fine clothes, pretty manners, spiced and highly seasoned food, stimulants, drugs, or sedatives must be sedulously avoided and interdicted. The best mannered child is the one who, while respectful, obedient, and loving, can make the forest ring with the Indian halloo, can eat heartily at the table, laugh the loudest and sleep the longest, or who, by aid of spoon and tongue, can ladle sand in and out of a tin cup for many hours per diem, until wearied of play, sleeps upon his own dung-hill, the radiant sunshine playing with his golden tresses.

Many parents complain bitterly in after life and wonder why their children are not as they should be, but are nervous, sickly, and willful. The moral education of the child is a subject of intense importance, and parents should not marry and bear children unless they are willing to take up this "white man's burden." They and their children will suffer unless they are willing to train the little ones. *Moral* training does not consist in a few platitudes retailed to a child, or in confining him in church once a week on Sundays. Physicians should be constantly consulted. They are rarely questioned, and then casually; their advice received never, or rarely followed. The most paramount necessity is obedience, and without it nothing can be accomplished. It is a trait the lower owes to higher, the subordinate to his superior. The pretty trait in my little fox terrier

is his quick response to my call. Obedience involves many higher traits. The child should be trained to obey from the cradle. When this is accomplished, the foundation for other training is laid. Self-control and repression must be inculcated, and he be taught constantly that to control himself is to control others. Courageousness and moral fearlessness are two features that, when well drilled in, mould a life free from morbid fears and anticipations. Bad habits and cruelty must be instantly repressed, and no better way to teach this than the training of domestic animals by kindness. Bad humor, egotism, and peevishness must be repressed, and his sense of high honor, perfect truthfulness, and patience stimulated by well directed talks and interestingly told tales. He must mingle with his fellows and learn that communism and control are essential to a government like ours. He must be taught to bear pain with fortitude and control the emotions; to accept with good grace and pleasant mien and smiling countenance an adverse decision, and that to harbor resentment and desire for revenge is unmanly and improper. To sulk is one of the worst traits in a child. Children should have as they grow older carefully selected literature, and should be carefully guarded. Morbid sexual ideas are too often awakened by the theater, bad books and worse companions, but this can be counteracted by carefully worded talks and counsel regarding the sexual organs, and many dangers and much suffering in after years prevented by thus early instilling firm self-control. The question of the education of a child is rather one of individual study than of a general formula. The subject is stupendous, and can be only lightly touched in such a space as is allotted me to-day.

The adult should avoid the strains and stresses of life as much as possible, and when subjected to unusual trouble, worry or strain, so arrange his labors and trials as to lessen the burden so imposed, taking care of his sleep, digestion, and open-air exercise.

FRIEDREICH'S ATAXIA: WITH REPORT OF TWO CASES.

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The remarkable nervous affection known as Friedreich's ataxia, hereditary ataxia, and hereditary ataxic paraplegia was first systematically described by Friedreich in 1861. It is one of the rarest of well-known nervous diseases. Gowers, in his Diseases of the Nervous System, edition of 1888, gives the number of recorded cases as only sixty-five; but Dana, in a more recent edition of his Text-Book of Nervous Diseases, places the whole number of cases reported at about two hundred. According to this writer, more cases have been reported from America than any other country, and the smallest number from France.

Since Friedreich's original report the disease has been studied by a large number of observers in this country and Europe, and its literature is extensive and interesting.

Dana defines Friedreich's ataxia as "a chronic degenerative disease affecting the long fiber systems of the spinal cord, and especially that of the posterior column, and later those of the lateral columns." He states that the process begins in the posterior column in the lumbar region and extends upward and downward, finally involving the medulla and especially the hypoglossal nuclei, but a study of the symptoms in reported cases seems to me to show that this order of invasion and extension is not invariable. The clinical history and morbid anatomy in cases which have come to autopsy both point to an imperfectly developed spinal cord, congenital or connate, as the chief or fundamental causal influence in the disease. Heredity is well

marked, though rarely direct; that is, children rarely inherit the disease directly from parents. Bramwell was able to find only one instance on record in which a parent and child—father and son—were certainly affected. Everett Smith, of Boston, reported a case in which the father of a family in which the disease existed showed symptoms of ataxic paraplegia, but as he was sixty-six years old and Smith did not mention other important symptoms, it is doubtful if his disease was true Friedreich's ataxia. As Bramwell states, one reason why the disease is so seldom transmitted directly from parents to children is the fact that it usually begins in childhood or early youth, and is generally far advanced before the subject reaches marriageable age; but cases are recorded in which the subjects of the affection have married and borne children, and the children have been free from the disease. One of the patients whose case I shall report is married, and has a boy now thirteen years old, who as yet presents no evidence of the disease.

While Friedreich's ataxia is rarely transmitted from parent to child direct, in probably no other disease is heredity more certainly and remarkably manifested. The sixty-five cases collected by Gowers occurred in nineteen families. The persistent but irregular influence of heredity in the disease is illustrated by a remarkable family history related by Rutimeyer. In 1710 a man named Blattner married, and was registered in Kuttigen under the nickname of "The Stumbler." All the direct descendants of this Blattner appear on the official register of Kuttigen, in 1840, under the surname of Stumbler, showing the impression his gait made on the people about him. At the time of Rutimeyer's report four families, the direct descendants in the male line of the original Stumbler, existed, and four generations after him. In all these four families some cases of Friedreich's ataxia existed, and yet there was no record of any case in any of the intermediate generations.

The affection is strictly a family rather than hereditary disease. Only a general neuropathic inheritance can generally be traced.

Neuroses of various kinds are often found in family histories. From the pathological resemblance of Friedreich's ataxia and tabes dorsalis one might infer syphilis to be an important etiological factor, but the early age at which the disease usually makes its appearance would exclude syphilis, unless inherited, in most cases. Dana believes inherited syphilis is an important element in the production of the disease in many cases, while Bramwell thinks it does not play any part. Alcoholic intemperance in parents is thought to be an important causative factor. As in multiple sclerosis, a related cord affection, the disease has been noted frequently to follow recovery from the acute infectious fevers.

The pathology of Friedreich's ataxia is very complicated, but certain changes in the cord have been found quite generally in the autopsies reported. The imperfect development of the cord is shown by its shrunken, flattened appearance. In some cases the medulla and pons were smaller than normal. A general sclerosis involving all the long fiber systems is found, but the degeneration is not equal in degree or extent in all the tracts. In the posterior tracts the column of Goll is usually found sclerosed throughout. Burdach's column is less but very extensively sclerosed. The sclerosis of posterior columns is greatest in the lumbar region. In the lateral columns the crossed pyramidal tracts seem to suffer most. They are always found extensively diseased, and generally practically throughout. The direct cerebellar tracts, Clarke's vesicular column, Gower's tracts, the antero-lateral, antero-median, and indeed nearly every known tract in the cord is more or less involved. There seems to be one notable exception: Lissauer's tract appears to escape, and this is one of the pathological differences between this disease and locomotor ataxia. Authorities differ as to the frequency and amount of involvement of the posterior roots. In some cases they are undoubtedly involved, but probably never to the same extent as in locomotor ataxia. The sclerosis often extends to the medulla and pons, and especially involves the hypoglossal nucleus

cells. Another striking difference from tabes is shown in the comparative slight involvement of the peripheral nerves. A peculiar feature of the morbid process is seen in the presence of areas or zones of healthy tissue between many of the sclerosed areas.

It will be seen that Friedreich's ataxia is a combined sclerosis of remarkably extensive and varied distribution. From such extensive morbid changes, involving so many different parts of the spinal cord, a great number and variety of symptoms might be anticipated. The various symptoms mentioned by different writers are indeed very numerous, but the chief ones may be fairly accounted for by the nature, extent, and distribution of the lesions when they are studied with regard to the known functions of the parts affected and in comparison with other system diseases of the cord in which like lesions and symptoms occur. The three diseases which bear a clinical and pathological resemblance to Friedreich's ataxia are the ordinary type of ataxic paraplegia, locomotor ataxia, and multiple or disseminated sclerosis. Several symptoms of all these affections are present in nearly all cases of Friedreich's ataxia, but not at all in the same combinations or order in which they occur in these diseases. The principal symptoms are ataxia and paresis of the legs, which gradually extends upward, involving the arms later, and finally the tongue and muscles of articulation; a peculiar ataxic gait, reeling, staggering, or cerebellar in character; a characteristic speech; sometimes spinal curvatures, changes in the shape of the feet, and nystagmus. Negatively, lessened or lost deep reflexes without material change in the superficial reflexes, slight or entire absence of sensory symptoms, no eye symptoms except nystagmus. A majority of these symptoms occurring in two or more young members of the same family would be sufficient to establish a diagnosis. Choreic movements and oscillation of the head are frequent, and vertigo and headache not uncommon. A host of other symptoms have been reported as occasionally present, as slight anesthesia, tremor, muscular spasm, tachycardia, dyspnea,

difficult deglutition, slight paralysis of facial muscles, vasomotor disturbances, etc. The disease most often begins about puberty, but sometimes much earlier and occasionally much later. Cases are recorded as early as the fourth year and as late as the twenty-fourth. The first symptom is usually the ataxia and weakness in the legs. It is at first shown by unsteadiness in walking, but the gait soon assumes the cerebellar type, and the patient reels and staggers like a drunken man. These symptoms increase with the extension and increase of the morbid process until the ataxia of arms and hands somewhat resembles that of multiple sclerosis, but the movements are not usually so exaggerated, and there is no intention tremor. Charcot compares the motions of the hands in attempting to grasp or pick up an object to that of a bird swooping upon its prey. The speech also resembles somewhat that of multiple sclerosis, but it is more uncertain and irregular. Marie compares it to the gait, and aptly calls it cerebellar.

As the disease progresses the patient becomes weaker and more ataxic, until walking or even standing without assistance becomes impossible, and finally the patient becomes bedridden. The face has a dull expression, though the intellect is not much impaired.

Romberg's symptom may be absent or present throughout the disease, but I have found no record of a case with the Argyll-Robertson pupil. As has been said, decided pain or other sensory symptoms are not usually present, but slight or dull pain or aching in the limbs does occur, and Charcot insists that lightning pains as severe as in locomotor ataxia are sometimes felt. Vesical and sphincter disturbances are almost always absent, but Sachs states that difficulty in micturition and defecation does occur.

Deformities of the feet are very common. The several forms of talipes may exist, but the most common and characteristic changes are a compressed and shortened appearance of the foot in the antero-posterior diameter, with enlargement or thickening of the balls of the foot and toes, giving the foot a short, stumpy

look. The instep is high, and the first phalanges of the toes and especially of the great toes are overextended. This accurately describes the feet of one of my patients. In addition to changes in shape, vasomotor disturbances of the feet sometimes occur, and are shown by a congested or mottled appearance. This is also present in one of my patients.

The spinal curvatures are usually lateral, but they may be antero-posterior, or, as in one of my cases, both forms may exist in the same patient.

The advance of the disease is variable. Some authors speak of apparent temporary arrest, such as occurs sometimes in paretic dementia and locomotor ataxia, but the tendency is toward steady and progressive failure until the patients are bedridden or confined to a chair, where they often linger for many years before death. The lives of sufferers vary from a few years to twenty or thirty years.

Not much could be learned of the family history of the women whose cases I have to present. The father is a negro gardener, but his hair and complexion give evidence of white blood. He is fifty-nine years old, of fully average intelligence for his race and condition; is healthy, and says he has always been so. He denies syphilis, and shows no sign of it; says he has never been intemperate, and has no knowledge of epilepsy, insanity, or any other nervous disease in his family. The mother was probably a half-breed, as the children are fairer than the father; practically nothing was learned of her own family history. She is said to have been healthy until the later years of her life, when she was subject to what her husband calls fainting spells. From his description these appear to have been severe attacks of vertigo or apoplectic attacks. When she was fifty-one years old she had a severe apoplectic attack with hemiplegia from which she recovered, but always was weaker on the paralyzed side afterward. Two years later, at the age of fifty-three, she had a second attack with paralysis of the other side, from which she died. There are three children; the oldest is

thirty-eight, is married and has healthy children; she is said to be healthy and strong. The other two children are the subjects of this paper.

CASE 1. Susan H., the younger of the two patients and the youngest of the three sisters, was the first attacked. She is now thirty-four years old. The imperfect history I was able to get reveals nothing of importance of her early life. She is said to have been a healthy child, but to have suffered a good deal with pain, supposed to be rheumatic, in her legs as she grew up. She was also subject to headaches. When she was about seventeen, while working as a house servant, her gait first became unsteady and awkward. The awkwardness of gait increased, and she reeled or staggered in walking. Her father says she was often thought to be drunk. Along with the unsteadiness some weakness of the legs developed, and later her arms became affected, and still later her tongue and muscles of speech. Neither she nor her father can remember accurately how long the different symptoms were developing, but evidently the ataxia and weakness gradually increased for about eight years, when she was no longer able to stand or walk without assistance. She has been in bed now about nine years, and the disease, which has existed for about seventeen years, seems to have made little or no progress for several years. I first saw her a year ago, and there has been little if any change in her condition in the past year.

The appearance and condition of the woman now is most remarkable. She lies almost always on her left side. The head is drawn sharply back and to one side, and the body is curved from the head to the buttock. The position is not at all the opisthotonos of hysteria; it is somewhat like that sometimes seen in advanced stages of progressive muscular atrophy, but not just the same. The thighs, legs, and feet are extended, and there is suggestion of beginning talipes equino-varus in the feet. The arms are somewhat extended, sometimes flexed at the elbow, the hands flexed on the forearms, but there are no contractures. There is a distinct combined antero-posterior and lateral curva-

ture of the upper dorsal spine, and also of the cervical vertebral column. The strong backward traction of the head and sharp curvature of the neck makes the front of the neck very prominent, giving the appearance of considerable thyroid enlargement. There is some enlargement of the thyroid, but it is slight. There is some atrophy of muscles about the neck, shoulders, abdomen, and legs, but none more apparently than could be accounted for by the years of want of use. Apparently there is not nearly sufficient atrophy of the muscles of the abdomen to account for the persistent backward bending of the body, and her father says that when she is asleep she lies on her back, and her body is quite or nearly straight. She has complete absence of knee-jerks. The superficial reflexes are apparently not altered, but the choreic and ataxic movements make it difficult to determine this. She has no nystagmus, vesical or sphincter disturbances, anesthesia or other sensory symptoms.

When she lies quietly in bed choreic twitching of the muscles of the head, trunk, and limbs may be seen. The slightest effort at voluntary movement at once brings on violent ataxic movements of the limbs, head, and body. I do not remember ever seeing ataxic movements of the body so violent in any other patient. An attempt to hold her on her feet or in a chair to be photographed proved a complete failure.

Her voice is hoarse or husky, and whispering, owing to pressure on the larynx from the curvature of the neck probably. Her speech is at times slow and scanning, like that of multiple sclerosis, at others hesitating, and sometimes almost explosive in character.

The history of this case, excepting the rather advanced age at which the symptoms first appeared, and the fact that she is the younger of the two subjects of the disease, is fairly typical, and she has most of the major and essential symptoms of Friedreich's ataxia.

CASE 2. Carrie M. is thirty-six years old, two years older than her sister whose case has been described. Her early his-

tory, so far as I was able to get it, contains nothing of importance bearing on the disease. She seems to have been a healthy child, and grew up to be a healthy, well-developed woman. She was married at twenty-two, and one year later a son was born. She and her father both insist that she had no uncertainty of gait, weakness of limbs, or other symptoms up to the birth of her child.

One month after the child was born the first symptom of the disease was noticed. She states she first noticed a slight drawing of the head to one side, but careful questioning makes it probable that she had unsteadiness and possibly weakness in her legs a little before this. The ataxia and paresis increased and extended in the usual way, gradually and successively involving the arms and head. As in her sister's case, it is not clear how rapidly the disease progressed, but it seems to have reached its height eight or nine years ago, and there has been little or no advance since then. She is well nourished. As she sits in her chair her expression is dull aud listless, but her intelligence seems to be little if at all impaired. Her head is drawn a little to one side, and she has a slight but constant oscillation of the head from side to side. There is marked weakness of the legs and arms, but no atrophy of the muscles of the parts. She can not walk or stand without assistance, but stands by holding to a chair, and is able to make her way about the room by pushing the chair before her. She has choreic movements of the hands and head. Her inability to stand makes it difficult to determine whether she has Romberg's symptom or not, but apparently the swaying when she stands with assistance is not increased by closing the eyes. The deep reflexes are abolished, but there is no apparent change in the superficial reflexes. She has no anesthesia, vesical or sphincter disturbances. There is a slight but distinct lateral curvature of the spine.

The feet are almost perfect types of the foot of Friedreich's ataxia. They conform closely to the descriptions of Bramwell, Sachs, and others. In addition to the changes in the shape of the

feet, they have a mottled, congested discoloration, showing vasomotor disturbances. The ataxic movements of the hands and arms are well marked, though not nearly so violent as those of her sister. They are quite like those of multiple sclerosis. There is considerable resemblance to the swooping movement of the hands described by Charcot in picking up objects. The speech is also very characteristic; it is slow, slightly scanning, at times hesitating and uncertain, answering quite well to Marie's "cerebellar speech."

THE USE OF CHLOROFORM IN LABOR.

By Walker Bourne Gossett, M. D.
Louisville, Ky.

"Among primitive people, still natural in their habits, and living under conditions which favor the healthy development of their physical organization, labor may be characterized as short and easy, accompanied by few accidents and followed by little or no prostration."

Obstetricians and chloroform would never be needed if women of to-day had as little pain during childbirth as Wenonah in Longfellow's song of Hiawatha:

> There among the ferns and mosses,
> There among the prairie lilies,
> On the Muskoday, the meadow,
> In the moonlight and the starlight,
> Fair Nokomis bore a daughter.

The civilized woman of to-day is far from being in a physiological condition. She has not the physical endurance and vital force. Higher development renders her more susceptible to bodily suffering.

"The pains of childbirth are liken unto the torments of hell." Many physicians say it is a natural pain, and nothing should be given, but let nature take its course, and let women suffer. If the Almighty has placed an agent on this earth to assist woman to bear this pain, or lessen the sensibility of the pain without materially decreasing the force of power of the uterus and increasing the danger to mother or child, it is our business as physicians to find what this agent is and apply the same.

Chloroform is our agent, and, if given correctly, it will lessen the sensibility of the pain, having no marked effect on the force

of the power of the uterus, and not increasing the danger to mother or child. As you stand over your patient, seeing her suffering the agonies of hell, does not your heart go out to her in sympathy? Does it not seem that this suffering ought to be more evenly divided between the male and the female? Both have the pleasure of sexual intercourse, but when it comes to the result, the woman must bear all the pain. The old saying is very true: let the wife have the first child, the husband the second, the wife the third, and the husband the fourth, there would not be a fourth child. A man has no realization—except a physician, and often I think some of them do not—of the severity of the pain of childbirth.

Early in 1847 the illustrious Sir James Y. Simpson proved that inhalation of sulphuric ether could be safely and successfully used for the relief of pain in childbirth; and later in the year he established the same fact as to the inhalation of chloroform. Obstetric anesthesia soon found a few in Great Britain and on the Continent to advocate and practice it. In the United States Dr. N. C. Keep, of Boston, was the first American physician to administer an anesthetic in labor. Dr. Walter Channing, a distinguished American physician, advocated the practice; his treatise on etherization in childbirth was published in 1848.

The late Professor Henry Miller, of this city, the author of Miller's Text Book of Obstetrics, gave chloroform to a woman in labor on the 13th of March, 1848. This was the *first* time chloroform was thus used west of the Alleghany Mountains. Dr. Miller remained faithful to anesthesia in labor the rest of his honored life; and he strongly advocated the practice, and with his well-known ability answered the arguments adduced against it. Miller and Channing are the two names in this country that shine with the most luster in connection with the early advocacy of obstetric anesthesia.

On the other hand, three of the most eminent obstetric teachers, Meigs, Hodge, and Bedford, strongly opposed the use of anesthetics in normal labor, and their influence was more powerful

than that of its advocates. The controversy here was but the reflex of that which was occurring in Great Britain. Simpson asserted that it was only a question of time as to the general adoption of anesthesia in parturition, and, gentlemen, that time has come.

On the other hand, Dr. Ashwell and Dr. Tyler Smith were the most prominent London obstetricians opposing the practice, and declared that "unnecessary interference with the providentially arranged process of healthy labor is sure, sooner or later, to be followed by injurious or fatal results," . . . "that chloroform need only be extensively used to insure its entire abandonment," and that it was "a duty to urge every plea against its further use." More than *forty* years have passed since these words of Simpson and of Ashwell were uttered; the prophets are dead, but the prophecy of Simpson is about fulfilled; chloroform has now been generally adopted.

Doubtless the influence of Meigs, Hodge, and Bedford did much in this country to prevent the use of anesthetics in labor. And yet Dr. Hodge, while refusing the parturient the relief to be had from chloroform, indicates the severity of her suffering by saying she is "agonized and semi-delirious." We know that brief surgical operations much less painful than childbirth are not done without the use of an anesthetic.

Arguments against the use of an anesthetic during labor have been quoted from the Bible. It is asserted by some that "suffering in labor is necessary in order that the mother should love her child." Nature seems to have made no corresponding provision to secure paternal love.

Depaul gave some reasonable objections to the use of chloroform in labor, among which are the following: (1) It may kill the patient; (2) the anesthetic sleep deprives her of reason, so that she can not participate in the great act accomplished, and this participation is in almost all cases necessary; (3) the inconveniences and dangers are not compensated by the advantage arising from the diminution or suppression of pain.

In reply to these objections, first, chloroform has been used in natural labor many hundreds of thousands of times, yet not over half a dozen cases of death are on record where it was administered by a competent medical man.

The following almost completely exempt the danger from chloroform: The horizontal position, the intermittency in its use, the anesthesia not being profound, the influence of uterine contractions; the alternately relaxing and contracting of the uterus reinforces the action of the lungs and heart, and thus asphyxia and syncope are avoided.

In answer to the second objection, it is obstetrical anesthesia, and not surgical, which is sought. The patient is not unconscious and incapable of voluntary effort.

As to the effect of chloroform on the force of uterine and abdominal contractions when given correctly, I have never noticed this force materially decreased. The same holds true of the contractions of the uterus after the second or third stages of labor, and chloroform does not predispose to post-partum hemorrhage. Even admitting that the labor is rendered slower, the lessened suffering makes the trial not so severe and exhausting. Also admitting that there may be a liability to post-partum hemorrhage, a proper management of the third stage of labor and the use of ergot-aseptic, hypodermatically given, will almost certainly avert the danger.

The Choice between Chloroform and Ether. Chloroform is preferred by most men. It is of a pleasanter odor, its action more prompt, and a less quantity of chloroform is required. Chloroform can be used at night without any danger from light or fire; ether can not, as it is inflammable, and at night we certainly have the greater majority of obstetrical cases. By some it is held that relaxation of the uterus and post-partum hemorrhage are much rarer after the use of ether. King prefers ether, and his main reason is this: "Ether is unquestionably safer; and while the advocates of chloroform claim that but very few deaths are on record from its use when administered with unremitting

care and by the hands of an educated and experienced physician, yet these conditions can not always be constantly assured. All men are human; the unremitting care will sometimes remit; oversights and diverted attention happen to all, and in obstetric practice, with its inevitable fatigue, loss of sleep, and anxiety, are more likely to happen than in other fields of professional work. Hence, as a matter of safety, I prefer ether."

And he also says: "Ether is inflammable, and hence *care* is required in using at night," and, as "all men are human, the unremitting care will sometimes remit, oversights and diverted attention happen to all," and so might not the ether man blow up his patient, himself, and all in the room? which would be a calamity far worse than the death of only the patient.

Dr. J. C. Reeve, whose name is so well known in connection with the subject of anesthesia, in his contribution to the American system of obstetrics, "On Anesthetics in Labor," denies that ether is a safer anesthetic than chloroform, and, after a careful study of accidents from chloroform in labor, makes the following statements:

1. But one well-authenticated case of death is on record where the administration was by a medical man, and in that case no autopsy was held.

2. Dangerous symptoms have occurred but a very few times, and that almost always from violation of the rules of proper administration.

3. The danger when chloroform is used only to the extent of mitigation or abolition of the suffering of childbirth is practically *nil*; when carried to the surgical degree for obstetric operations, the danger is far below what it is in surgery.

4. No proof can be furnished that the parturient woman enjoys a special immunity from the danger of anesthetics, although facts seem to indicate that such exists. Her best safeguard lies in the care and watchfulness of the administrator.

Chloroform is not without danger in other operations, when only two or three inhalations are taken, and sometimes death

results from heart-failure. But in labor I think there is no danger of this shock taking place, because the pain of labor is somewhat of a shock to the patient of itself. The heart is physiologically prepared to meet this condition, so that the slight additional shock of chloroform, if there be any, adds little or no gravity to the condition. But if you are afraid of this heart-failure you may, during the first part of the second stage of labor, administer hypodermatically sulphate of strychnine and nitroglycerine.

In every case you should examine the heart, and, if you find any trouble at all, give strychnine.

The following are some causes for the administration of chloroform in obstetrics: "To lessen suffering produced by labor pains; to lessen the pain attending certain obstetric operations; to relax the uterus when its rigid contraction interferes with version; to promote dilatation of the os uteri; to reduce excessive nervous excitement which may interfere with progress of early stage of labor; to relieve eclampsic convulsions and mania; to relax the abdominal wall and lessen pain while the uterus is being pushed down in cases of abortion, when the finger is being introduced to remove retained secundines; in craniotomy to forestall unpleasant recollections; in cases of uterine inversion to relax the constricting cervix and to facilitate replacement; in bipolar version to lessen pain of introducing the hand into the vagina; in precipitate labor to suspend action of voluntary muscles and retard delivery; to dissipate 'phantom tumors' while making a differential diagnosis of pregnancy; to relax the os and cervix uteri while introducing finger to diagnosticate between uterine and extra-uterine pregnancy; in all cutting operations upon the abdomen; and sometimes in sewing up a lacerated perineum, when many sutures are required. In this last instance, and in all cases when chloroform is used *after delivery*, the greatest care is necessary. Chloroform after delivery should be avoided if possible."

Hirst says the dangers and disadvantages that it is claimed result from the use of anesthetics in labor are: "A prolongation of the process by weakening the uterine contractions and increasing the intervals between them; a disposition to post-partum hemorrhage; an increased liability to sepsis after labor by a relaxation of the uterine muscle and subinvolution of the uterus. These objections are ill-founded if the anesthetic is administered in a proper way. Accurate observation in some of the large German lying-in hospitals has demonstrated that an anesthetic, if not pushed too far, has no influence on the power, duration, or frequency of the pains. Subinvolution is never seen as a result of anesthesia unless it is pushed too far."

Hirst takes it that the choice in the Eastern seaboard of the United States is for ether, and also that chloroform is in disfavor in that part of the world; but although perhaps unjustly.

Playfair, in his last edition, says: "The practice has become so universal that no argument is required to establish its being a perfectly legitimate means of lessening the suffering of child-birth. Indeed, the tendency in the present day is in the opposite direction; and a common error is the administration of chloroform to an extent which materially interferes with uterine contractions and predisposes to subsequent post-partum hemorrhage."

Playfair, in speaking of chloroform and ether, says: "Practically speaking, the only agent hitherto employed in this country is chloroform, although the bichloride of methylene and ether have been occasionally tried."

The use of chloral in the first stage of labor does not interfere with the use of chloroform in the second stage.

The Manner in which to Administer Chloroform. You must withhold the chloroform until the correct time to administer it. The patient will beg for it, pray for it, cry for it, and even try to make those present use force to make you give it. But hold until the perineal stage—latter half of the second stage. This is the time woman suffers the most; large beads of perspiration stand out on her forehead, run down her cheeks, eyes bulging and quiver-

ing with pain, the whole form being on a rack of misery. Now take your chloroform inhaler and place it firmly over patient's nose and mouth. If you have not the inhaler, use a small handkerchief saturated with chloroform, or a tumbler containing a piece of blotting paper.

As you notice the pain coming on, sprinkle about a drachm of chloroform on the inhaler and instruct her to take deep inspirations before the pain reaches its height. The patient will take two or three deep inhalations—for they readily inhale—and at once the severity of the pain will be lessened. As the pain ceases remove the inhaler, and then as the next pain comes on replace it, only allowing it to remain during the pain. By this method of administration it will be impossible to give enough chloroform to cause danger. She may cry out just as loud as if chloroform had not been used, but afterward will tell you that she suffered very little, and invariably will thank you for having used it.

Chloroform may be used in the first stage of labor, though when the pains are severe in this stage I prefer hydrate of chloral.

There is danger of having to use chloroform too long when given in the first stage, thereby decreasing uterine force and predisposing the patient to hemorrhage. The same, perhaps to a less degree, applies to the first part of the second stage of labor. During the perineal stage, or at any stage, the chloroform may be pushed to complete anesthesia—surgical extent, if necessary—but in *natural labor* only to its obstetrical extent.

If there are any members of this Society who have never used chloroform, try it, and you will be so well pleased that you will use it in every case of labor. You will thereby receive the everlasting gratitude of your patients and be a blessing to the female sex.

DISCUSSION.

Dr. Lewis, Owensboro: I was waiting patiently for some one else to discuss the paper. I feel a little afraid, after listening to a paper

such as that in the nineteenth century, when chloroform is used so extensively, to raise my hand even in the slightest degree against the use of chloroform in labor. I have had some experience along this line, and I have had some recollections come to me that I regret. I make this preface because I do not want anybody to think me an old-timer or that I have not used chloroform. I have had experience with it, and have sometimes had cause for regret. It is not only the digital examination which enables us to tell exactly the progress of labor. There are but very few women who do not object to being frequently interfered with in the progress of labor. There are other things that will indicate the progress. It is often better for the doctor to be in the next room reading a book than to be sitting beside the woman showing his interest. I believe without chloroform the woman has less trouble following. After the use of chloroform I can not believe the uterus returns to its natural condition so well later on. I believe chloroform retards labor, and nausea often follows its use. And, on the whole, I do not think the indiscriminate use of chloroform should be resorted to. There is hardly a woman in labor but would grasp at any thing. She wants to get away from the pain, no matter by what means. If you tell her chloroform is the thing, and of course her neighbors have told her, then she will want it. Some neighbor tells her, "I took chloroform at the birth of my last baby," and then, of course, this woman wants the administration of chloroform. I do not object to the use of chloroform, but I do not think we should use it in every case.

Dr. TAYLOR: I want to thank the essayist for his paper, and I heartily endorse every thing he says. I think I am a little more enthusiastic on the subject of chloroform than he is, because I use it a little earlier. Just as soon as the cervix is large enough for the head to get out I commence the administration of chloroform, and by the time the head is pushing the perineum I have the patient almost anesthetized, and by the time of the last pains the woman experiences no pain at all. I have never seen the administration of chloroform lessen the progress of labor. It always relaxes the muscles, and I think favors delivery. There is also less shock. I give chloroform to relieve pain whenever I can, for that is our mission on earth.

Dr. THORNTON, Gravel Switch: I do not think that all cases of labor require chloroform. Some cases go through with very little pain, and in those cases chloroform does not seem to me to be necessary. I doubt whether labor is altogether a physiological process. The higher

you go in society the more susceptible to the pangs of parturition the woman becomes, and the lower in the scale of society the less pain we have and the less call for chloroform. Then there is another objection, that is the danger of the use of chloroform. If you ask a doctor when he goes to use chloroform if there is danger, he will respond, yes, there is a little danger. The chloroform relaxes the muscles, relieves the pain, and gives the woman the ability and the will to bear down under pressure which she would otherwise give back from when it produced pain. I use chloroform whenever I think it is indicated, just as I would use forceps, and not always when a woman wants me to, but when she wants me to and I think the case indicates its use. Both of these agents are powerful to do good, and both of them are powerful to do harm. In the hands of the intelligent physician they can relieve the patient of hours of untold suffering, and they also save the doctor hours of time.

Dr. Snyder: The use of chloroform we are doubtless all acquainted with. The majority of physicians I find are afraid of it under almost any circumstances. I use chloroform whenever I deem it necessary. I do not believe any set rule should be laid down to govern everybody in its use. Take into consideration the state of affairs and exercise your judgment, and administer chloroform if you deem it necessary.

Dr. Austin, of Bagdad: I have been using it since 1883, and I recommend it highly. There are some cases that do not particularly need it, but in the majority of cases I administer it as the essayist indicates.

Dr. W. B. Gossett: I make it a point to give chloroform in all cases. Certainly you can not lay down any fast rule to govern all cases. I say use chloroform to the obstetrical extent, not to the surgical degree, and there is a time to use chloroform to the obstetrical extent. The first stage of labor we know is the stage of dilatation. For two or three days before there is possibly some pain in the back and side. The second stage is the stage of expulsion, which is divided into two sections, the first and second halves. The latter half is known as the perineal stage, and we know that the severest pain is as the head of the child is going over the perineum. At this stage we should use chloroform to the obstetrical extent. Of course, sometimes we may need to use chloroform in the first, second, and third stages of labor, but in the normal case of labor chloroform need be used only in the perineal stage, as the head passes over the perineum.

TREAT PATIENT, NOT DISEASE.

By R. R. Sullivan, M. D.
Uniontown, Ky.

Being forced to face the endless variety of remedies on the one hand and disease uncontrolled on the other, I am often reminded of advice given me while a student of medicine—that is, to treat patient, not disease. At that time this was only a sentence to be noted and remembered. But each succeeding year has revealed to me additional meaning, until at present time I realize that this is a case of necessity, the only course to pursue. When remedies fail, when I am in doubt as to proper choice out of the few approved remedies, I hold this in mind as my guide.

My limited observation teaches me that among the many remedies there are only two kinds: One that attacks disease directly, the other that helps the human organism to resist the invading disease; and so, in general way, the physicians may be placed in two classes: one having unbounded faith in medicinal substances, backing that faith with their application to disease and confidently awaiting results; the other directing his efforts more to the aiding of the natural resistive power of the diseased locality.

As in all classifications, so in this, I realize fully that no fixed lines can be drawn. While a remedy may be named that could be placed in either class, there are many whose worth we know. We as physicians all use the two classes of remedies; the combined mode of treatment, so to speak. Yet, in my opinion, there are some who rely more upon the curative power of drugs, others more upon the aiding of the recuperative power of the tissues.

As in the beginning of my career I made the mistake of jumping from remedy to remedy in vain attempt to find one that

would cure where the former ones had failed, and as I know of physicians who have credited remedies with more curative power than subsequent experience proved they deserved, I feel justified in making two such classes of curative means, and as a sequence two such classes of physicians, and identifying myself with the latter, claiming that the vast majority of remedies are adapted to symptomatic indications rather than being directly curative. This is necessary, because medicine is not an exact science. We can not dispense with the frequent use of the expression, "I think so." Making use of the same expression of uncertainty, I think the most rational course to pursue is to treat patient, not disease.

Superficially considered, this mode of treatment seems more to be condemned than rank empiricism. For it may be said that in the latter the disease is brought to light and attacked by remedies that are claimed to be specific; while in the former, treating most prominent symptoms, often without early diagnosis, and looking to comfort of patient, seems only a means of relief to a patient succumbing to a disease which we have made no attempt to kill. But upon reflection the fact is evident that the mode of treatment in which our prime aim is to aid recuperative power of patient necessitates a more careful examination and more watchful care than where it is considered necessary to a cure to make exact diagnosis and treat disease according to the curative power of some popular remedy. Symptomatic treatment implies study of symptoms and applying to each one the remedy indicated throughout the course of the disease. As symptoms change, so should the remedies.

This does not make diagnosis any less necessary, as it should be made as early as possible, whatever may be the treatment.

In passing I would inquire why that perplexity and horror of uncertainty we have at bedside when diagnosis is not made after second or third visit? Is it the uncertainty of the mode of treatment we should pursue? It should not be, and very often is not. But it is the uncertainty of complications, prognosis, and good-will of our patrons, the symptoms of which we can

not interpret and guard against without diagnosis. Such I consider the most important use of diagnosis, only as an aid to proper interpretation of symptoms to be treated.

We regret that such is the status of therapeutics; yet we think it best to accept it as it is, rather than make false claims and arouse false hopes; rather employ our remedies in symptomatic treatment to which they are suitable than as specifics. Judging from some unreliable sources of information, we would conclude that our materia medica is being rapidly filled with specifics. This searching for specifics is legitimate, but when the test of time is applied, how rarely are they successful!

I believe in progressive therapeutics. I also believe in making distinction between real and spurious. I would hail the hour when we could have a specific for each disease, either curative or preventative. But that hour is not upon us. We have so few specifics that that mode of treatment is a mode of folly. Too often have we to face the fact that we have so many remedies that we have no remedy. We are too prone to use remedies much recommended as specifics, but whose powerful curative powers are disproved by cool statistics. At one time such unqualified laudations perplexed me, but now they only cause to arise two question marks—one preceded by "What experience has he had?" the other by "How much silver enters into his consideration?" The fact that very few remedies now in use were popular twenty years ago is evidence that specific remedies are not made in a day. As in book-making, so is it in regard to remedial agents, there is no end to their making, and so is their fate similar as they melt away with the seasons.

In this race for something new we can not call a halt; we have no such desire, but can demand a more thorough test and better recommendation than that given by enthusiasts on commercial basis. That more thorough test can be found in hospital and dispensary practice, upon patients that are willing to allow such experimentation as the only compensation to the physician. Thus we can select remedies with recommendations

based upon thousands of tests instead of ten or less. Statistics are not wholly reliable, but are our best guides, and until a remedy has stood such a test it should not be heralded as a specific, nor applied to our patients with such expectations. By such a method of selection only a few of the rapidly increasing remedies would come into general use, and it should be thus, for if a remedy fails in the test it is better that it never existed.

Finding so few specifics, our only recourse is to symptomatic treatment.

In most cases our first duty will be to make, as far as possible, the sickbed one of ease, after which our attention should usually be given to hygienic surroundings and proper working of human organism, so far as disease will permit. In many acute diseases a placebo is all that need be added, unless we should be so fortunate as to be dealing with one of the few diseases that have specific remedies. If the disease should be diphtheria, smallpox, or malarial fever, to which might be added rheumatism, it should be placed in foreground to be treated by the specific remedy. Even in these few, for which we have specifics, we are forced to face the necessity of being, to some extent, symptomatic in our treatment.

Quinine will not always cure malaria. The patient will present symptoms to be treated according to their indications.

The routine treatment of syphilis with mercury will place many failures to its credit.

In the treatment of diphtheria and smallpox we approach more nearly the ideal. In diphtheria it is our duty to employ the specific, though we know not what surprise the next twenty years may spring on our diphtheritic antitoxin.

Vaccination has stood the test of time. We have accepted and honor it.

I would re-echo the prediction that at some far-distant future period the treatment of disease may be shifted from that of curative to preventative; that history may repeat itself and find a highly civilized race holding physician responsible for spread of

disease, instead of limiting his responsibility to cure of individuals. Until that order of practice is established, it is our duty not to forget our patient; to have our attention centered on him with disease in background as a secondary consideration; that he himself is making the struggle with disease, and our duty is to remove, as far as possible, the horror of the sickroom and useless medication, and to do what his symptoms bid us to do in his struggle for restoration to health. This conscientiously done, our duty to him ends.

THE STOMACH-TUBE.

By H. H. Roberts, M. D.
Paris, Ky.

From the period that Kussmaul introduced into practice the stomach-tube until the present time its progress has been unretarded. It has been of untold value in the study of gastric diseases, and of great assistance in their diagnosis and treatment.

With all the modern methods of diagnosing chronic diseases of the stomach, none is so reliable as the stomach-tube, for by its use we are able to make a chemical and microscopical examination of the contents of the stomach after the test-breakfast; and at any time we can obtain the contents of the stomach in a rapid and safe way without any material inconvenience to the patient. Its increasing popularity is such that at the present time it is no longer the particular property of the specialist, but is used throughout the medical world. The claims of advocates of new scientific achievements are often so extravagant that they are misleading to many, and a valuable and useful instrument is put into disrepute or great harm is done the patient by the indiscriminate use of such an instrument. The more judicious student will, by cautious observation, test their value and the field to which they properly belong.

It is true that the great advancement we have made in the knowledge of gastric diseases is due to the introduction of modern technique, but that which may be indispensable from a diagnostic standpoint may become a dangerous thing when used as a routine treatment. Wide experience is essential thoroughly to grasp the true meaning and use of any one thing, but even the most experienced prefer to share responsibilities with some one who

has given the matter more exhaustive study than himself; but, unfortunately, we find enthusiastic followers of many particular lines of treatment, until they become so much abused that we find the indiscriminate use of them has either prejudiced our patients against them or irreparable harm has been done. Within the domain of medicine to-day I believe there is nothing that is more abused, especially in some parts of the country, than the stomach-tube. Many use it because it is recommended for stomach trouble, others because the patients request it; in fact, there is a tendency among patients troubled with stomach affection to treat themselves in this way because it has been recommended to some other patient; and, if the other fellow has kindred symptoms, he gets himself a tube and begins the washing, and, when not benefited, every other patient within a radius of several miles will be prejudiced against the use of the stomach-tube; if relieved, he recommends it to others.

I know of an instance where a patient had lavage used for a few weeks, and, being greatly benefited from its use, and having become an expert in manipulating the tube, washed the stomachs of the whole family every morning before breakfast as a prophylactic. This harmful use of so valuable an article is not confined to the laity, but frequently physicians recommend the use of the tube, and often wash the stomach several times a day, and thereby great harm is done.

Let us speak briefly of the modern stomach-tube and the proper technique of its use. The tube which I prefer and believe to be the best on the market is a modification of Ewald's, consisting of a soft rubber tube about thirty inches long, to one end of which is attached a glass funnel, the other end being open and having two slits on either side half an inch long and one fourth of an inch wide. Above the side openings are made a number of perforations, going through the caliber of the tube, and about one sixteenth of an inch in diameter. The side slits prevent the tube from becoming occluded from mucus, and the small perforations act as a sprinkler, bringing the fluid into contact with a

large portion of the stomach. The tube should have a white mark about sixteen inches from the stomach end, which is the average length from the teeth to the stomach.

There are many kinds of apparatus for washing the stomach, such as the Leube-Rosenthal apparatus, Hemmeter's double current stomach-tube, etc., but as these forms are more adapted to the use of the specialist, we will not discuss their utility.

The technique of using an ordinary stomach-tube is very simple. The first and most important procedure is to secure the utmost confidence of the patient and explain carefully the whole operation; do this even to the most minute details, and, if the patient perchance should be unusually timid, an opportunity for observing with what ease a more experienced patient introduces the tube will be of valuable assistance. Avoid the use of all oils or greasy lubricants. Seat the patient in a straight-back chair; have him to lean his head slightly forward (most patients throw their heads backward), wet the tube with warm water, place back on the tongue, and tell the patient to swallow; the tube will readily enter the esophagus, when it can be readily passed into the stomach. Time may be saved with patients with tender fauces, especially those who smoke a great deal, by spraying the throat with a mild solution of cocaine, two to four per cent, but this procedure will seldom be needed. After the tube has entered the stomach, avoid moving the tube, as this brings on nausea and vomiting. Have the patient breathe deeply and regularly, and attract his attention to something else by a pleasant conversation or some object. Plain warm water is the most desirable fluid to wash the stomach with. Many drugs have been recommended to use in the lavage, but I find that, while many may be beneficial, it is best to use plain water for lavage, and afterward, if necessary to use drugs, to use Einhorn's gastric spray apparatus. By raising and lowering the funnel end of the tube, the stomach can be filled and emptied many times without any discomfort to the patient.

The rapid strides which have been made in the knowledge of gastric diseases are due to the introduction of modern technique. We, then, as physicians, should not abuse their valuable assistance nor let our patients abuse them. Under no circumstances should a patient be given a tube to use himself, and it should not be used by the physician until a positive diagnosis has been made by an examination of the filtrate of the stomach or other means.

The stomach-tube should never be used in very weak patients or old persons while in the erect position, but this class of patients should be treated in either the recumbent or reclining position.

The tube should never be used without a thorough examination of the patient's thorax. Penzoldt reports a case where the patient was to have had his stomach washed by means of the tube in the morning, but for some reason it was delayed until the next morning; in the interval the patient died from the rupture of an aortic aneurism into the esophagus.

The use of the tube, as far as gastric lavage is concerned, is but seldom required. From a diagnostic standpoint, the tube is indispensable. The indiscriminate washing of the stomach is capable of much harm, and is often positively injurious to the patient. In cases where there are large quantities of mucus present, the tube should be used with a mild alkaline solution in the fluid to facilitate the dissolving of the mucus. If the patient shakes himself occasionally during the operation the fluid will be brought in contact with all parts of the stomach wall, which can thus be cleansed thoroughly. The tube should not be used oftener than every other day, or best, two or three times a week. Use from one to three quarts of water, or until the wash returns clean. In cases where there is a stagnation of food in the stomach, resulting from either muscular weakness or stenosis, causing dilatation of the stomach, the use of the tube and lavage is of great benefit. Quite large quantities of fluid are often necessary to cleanse thoroughly these cases where there is marked dilata-

tion. The tube is contra-indicated in all constitutional diseases, viz:

1. Heart disease, especially those in which there is defective compensation.
2. Myocarditis.
3. Angina pectoris.
4. Fatty heart, especially the advanced stages.
5. Aneurism.
6. Recent hemorrhages, such as pulmonary, gastric, vesical, apoplectic, renal, rectal, etc.
7. Pulmonary tuberculosis.
8. Cerebral hyperemia.
9. Advanced cachexia.
10. In the continuous fevers, typhoid, remittent, etc.
11. Where there has been a recent hematemesis.
12. Ulcer of stomach.
13. Carcinoma of the pylorus, especially when there has been vomiting of the coffee grounds.
14. In all cases where there is a tendency for the gastric mucosa to bleed easily.
15. In those cases where the gastric affection is secondary to some more important primary disease.

The many conveniences, and especially the great aid the stomach-tube has given us in the exact methods of scientific analysis of gastric diseases, have, like all important therapeutic means, been abused, but will ever prove a *benefit* to suffering humanity in scientific hands, used in a scientific and judicious manner.

THE PREVALENCE OF AMETROPIA AND HETEROPHORIA, WITH REMARKS ON EYE-STRAIN.

By A. G. Blincoe, A. M., M. D.
Bardstown, Ky.

When I first heard of eye-strain as a cause of nervous diseases I supposed that cases of it were rare and found only occasionally. I thought perhaps a number of cases might have to be examined before one would be found with a refractive or muscle error. But after I had been doing refractive work for some time and had examined the eyes of quite a number of suspected persons, I was astonished to find every one with either refractive or muscle error, and sometimes both. These cases, however, were those complaining of some of the symptoms indicating eye-strain. I then became curious to know about how many people have refractive or muscle errors, and looked for some statistics on the subject to see if I could get any information that would enable me to make an approximate estimate of the per cent of mankind that are ametropic or heterophoric. Being a general practitioner and consequently not very extensively supplied with ophthalmic literature, I was unable to get a very large mass of statistics, but found that four different observers had in a total of over four thousand examinations under atropia, especially in school children, reported less than five per cent of emmetropic eyes. These examinations were made years ago when the smaller refractive errors, the correction of which are now giving such satisfactory results, were probably not considered, and no muscle tests at all were made; so that if heterophoria had been taken into consideration, it is more than likely that this small per cent of perfect eyes would have been still further reduced.

Since seeing these statistics, I have, in talking to some of my patients, sometimes remarked that probably nine out of ten, or possibly nineteen out of every twenty of us, have defective eyes.

I did not then suppose, however, the condition to be so very general as it would seem to be from the following:

In a very interesting paper read at the last meeting of the American Medical Association by no less an authority than Dr. George M. Gould, of Philadelphia, entitled, "A Pair of Mathematically Perfect Eyes," he says:

"Absolute emmetropia, a mathematically perfect pair of eyes, does not, I believe, exist. A perfect leaf has not been found, nor absolute symmetry in any organic thing. The report of perfect emmetropia is a confession of negligence or unskillfulness. I have made such reports myself, and can therefore speak dogmatically. If such a diagnosis has been made without a mydriatic, the negligence deserves a much harsher naming."

In the discussion of another paper at the same meeting Dr. B. Alexander Randall, also of Philadelphia, a man of very large experience, says:

"When I hear of hosts of cases that are emmetropic, I am skeptical as to all the rest. I must say, . . . as a result of my investigations, that true emmetropia is almost an unknown quantity."

I have seen no statistics of muscle errors except the one hundred medical students examined by Dr. Tiffany, in which he found fifty-seven per cent of heterophoria. It is not contended, of course, that all cases of ametropia or heterophoria cause serious nervous or other troubles. I think there are many persons who go through life with refractive or muscle errors without suffering serious inconvenience from them. I am prepared to believe this from the fact that, after examining many elderly people for presbyopia, I have often found ametropia or heterophoria which had seemingly never caused any of the troubles usually arising from these conditions; yet these very people

might have enjoyed more vigorous health if they had had their eyes properly attended to in early life.

On the other hand, I have seen many younger persons suffering from asthenopia, etc., who dated their troubles from a spell of sickness. It seems, therefore, that in strong and healthy persons eye-strain may show no marked symptoms; but if these persons become weakened by disease or otherwise, the symptoms may then make their appearance.

In regard to this matter, Hotz, says:

"Many eyes can endure a great amount of strain with impunity, while others are so constituted that their powers of endurance are quickly exhausted. One person may need glasses for the correction of a small amount of ametropia, while in another the correction of a much higher degree is unnecessary, and glasses would be superfluous. We can not draw the line at a certain amount of ametropia, but should correct it, no matter how slight in degree, whenever it leads to disturbances of which eye-strain constitutes the most frequent cause."

That a large number of persons do suffer from this cause I have, from my own experience in the last seven years, not the slightest doubt. I have myself treated about two hundred cases of headache and other nervous troubles by correcting refractive and muscle errors, with the result of about forty per cent cured and fifty per cent benefited, making a total of ninety per cent cured or benefited.

Many others of much larger experience have reported equally as good or better results from the same treatment.

In an editorial in a leading eye journal of September, 1898, the writer says:

"It is the conviction of many scientific-minded and careful men that eye-strain has a great deal to do with functional gastric troubles, with anemia, with the origin of glaucoma, cataract, etc. . . . We directly relieve ten times the suffering every day by refraction that we do by operations, and we prevent a hundred times that amount."

Now, if these views are not overdrawn, we would hardly exceed our duty to our patients if we should advise every one suffering, not only with any of the functional nervous diseases but with any chronic gastric or intestinal derangement not accounted for by other causes, to have his eyes examined by a competent refractionist.

I believe that there are many persons who suffer from eye-strain, unconsciously perhaps, who are in a debilitated condition on account of it, and therefore more susceptible to disease germs and consequently more liable to take certain diseases and less able to cope with them when attacked.

I am further convinced that many persons suffering from consumption and other chronic debilitating diseases might be benefited, to some extent at least, by having their eye-strain, if any, corrected, thereby relieving them of one factor—a loss of nerve force due to the eye-strain—in causing their debility.

In a paper read at the last meeting of this Society I reported several cases that tend to bear me out in this latter opinion. Several of them who had made no complaint whatever of any eye trouble were found ametropic or heterophoric, and since wearing their correction a year or more have improved materially in general health and strength, and some of them have gained from fifteen to thirty pounds in weight. Several persons to whom I have related the case of the young man who had been going on crutches for two years and laid them aside within a year after putting on glasses for headache, have laughed at the idea of a pair of spectacles enabling a cripple to go without his crutches; but when we bear in mind the fact that it is the nerve force which runs the human system, and that the glasses simply stop a leakage of this force, caused by the eye-strain, and thus allow the system to build up, it does not seem so absurd after all.

One of the cases of epilepsy that I reported last year has had no attack now for over fifteen months. He had such strong external muscles that graduated tenotomies seemed in his case to do but little good. I finally, at the suggestion of Dr. Valk, of

New York, did complete tenotomies of both external recti, and afterward shortened both internal muscles before his muscle balance became normal.

Another case of chronic epilepsy, having spells about once a week, for which I simply fitted glasses in December last, has had but two attacks since. This patient has also been entirely relieved of his headache and dyspepsia since he began wearing his glasses.

DISCUSSION.

Dr. J. M. Ray, Louisville: The eye men, like the other specialists, have the reputation of being narrow-minded and of looking at only one thing. It is my impression, however, that as specialists we do not find so many wonderful cures following the adaptation of proper lenses as do some of our general practitioner friends who drift into the practice of ophthalmology. I must say I have never seen a single case of chorea, of epilepsy, or of any organic disease, cured by the adaptation of lenses. I have examined a good many cases in reference to eye defects, and I have yet to record a single case of relief from any of these diseases due to the use of glasses. We know an emmetropic eye is rare; the majority of people are hypermetropic. If that is true, why is it that an individual with a quarter of a diopter out of the way should be relieved of epilepsy or chorea by the use of lenses? People from 40 to 45 years of age often come to us for the adjustment of glasses, and we find sometimes from two to four diopters of hypermetropia. They have then reached the time in life when they are unable to overcome the defect. When young they were able by muscular effort, by what we call accommodation of the eye, to conceal the defect. When they reach 40 or 45 they begin to have failure of accommodation, and they then seek glasses. But if you carefully examine and question them, you will find that a very small percentage of them ever suffered from any of the diseases we hear so much about being due to eye-strain. Now and then cases seem to be caused by some defect of the eye muscles. We have heard a great deal in the past ten years about the eye muscles, and I am in the habit of finding exactly the strength of the eye muscles, but when it comes to treating them, that is another thing. I do not believe any organic disease, such as epilepsy undoubtedly is, is ever cured by a tenotomy of the eye muscles, nor do I believe that chorea is ever

cured by tenotomy of the eye muscles. Then when it comes to adapting lenses and prisms, my experience, and the experience of men of national reputation with whom I have talked, is that prisms are very unsatisfactory. We all agree with the essayist that undoubtedly defects in the eye should be corrected. In many of these cases with slight defects, in which lenses are put on and are curative, the result is absolutely a mental effect and not due to any direct effect on the eye-strain. Furthermore, we often see, after wasting diseases lasting several weeks or months, that the general vigor is lessened, and in convalescence the patient suffers from eye-strain. This often occurs after typhoid fever. If they come to an eye man and he relieves the strain, he thinks he has cured them, but later they regain their vigor and lay aside their glasses.

Dr. O. M. Kelsey, Elkhorn: I would only call attention to one or two points in connection with the paper which was read. It has been stated by the essayist that perhaps such a thing as a normal, natural state of the eye does not exist, that is, as a mathematically perfect optical instrument. The eye should be viewed from two standpoints: as an organ of vision and as an optical instrument. It having been agreed by authorities that such a thing as a normal perfect mechanical eye does not exist, perhaps we look at the matter from a mistaken standpoint when we regard the metropic eye as the perfect eye. It may be that the hypermetropic eye is the normal eye under natural circumstances. The conditions of life are the occupations of husbandry and hunting and fishing in which the sight is normal at the horizon. A little hypermetropia gives just enough stimulus to the eye to see perfectly just this side of the horizon, so what we regard as hypermetropia might better be regarded as normal, and any departure from this should be attributed more to the pursuit which the individual follows. Farmers, those engaged in husbandry, those engaged upon the plains, cowboys, Indians, never complain of any necessity for glasses except for reading; that is, when they reach 40 or 45 years of age and the powers of accommodation fail. So I think we make a mistake in regarding the hypermetropic eye as the abnormal eye. It should be regarded as the natural eye, and the differences attributed to the pursuit the individual follows. We find in city practice many vigorous men and women engaged in pursuits which require close vision. Then is when the eye is strained, and then is when there is need for glasses, and it is usually of the hypermetropic character. The strain has been carried beyond the powers

of the individual, and it is more apt to cause myopia or short-reading, which is a disease that is usually stopped by the adaptation of proper glasses to meet the conditions. Beyond a certain degree, hypermetropia of course constitutes a defect which must be corrected. It is quite common for us to be consulted by people who have gone from ten to fifteen years with an error of refraction without any difficulty, who from some cause have their vitality depressed below the normal standard, and they develop trouble from eye-strain. The individual has been carrying a load as heavy as he could in the normal state of health, and when his normal health is decreased he can not stand the burden that he carried before.

Dr. A. G. Blincoe, Bardstown: In regard to Dr. Ray's statement that the general practitioner who takes up refraction work finds more diseases due to eye-strain than the oculist, that is nothing at all wonderful to me, for the people do not come to the oculist unless they are compelled to. But the general practitioner who is able to do refraction work properly will find many patients who are run down and debilitated and complain of various nervous disturbances whom he is able to build up only a little with tonics, and in these cases he will find some error in refraction or muscular strain, or both, and when that is corrected the patient picks up and improves. I could relate case after case that I have fitted up with glasses, and some on whom I have done tenotomies, with benefit to the patient. The general practitioner would probably thus see cases that the oculist does not see.

ONE HUNDRED AND THIRTY-TWO GALL-STONES REMOVED WITHOUT OPERATION.

By Edward Speidel, M. D.
Louisville, Ky.

Cholelithiasis, the condition leading to the formation of gall-stones, is beginning to be recognized as a very frequent disorder in the experience of medical men, and the fact that in many cases the diagnosis is only made post-mortem, by finding the gall-stones in the gall-bladder, proves that perhaps many of the obscure abdominal symptoms presenting themselves in our patients may be due to that condition. The treatment at the present time is almost entirely surgical, and the results of such treatment are very promising; but the laity still have a great horror of operative work, and in consequence many sufferers from this condition try one physician after another and one watering-place after another with only temporary or partial relief, but still refuse the panacea offered them by a surgical operation. The following case, presenting possibly the severest form of this trouble, was relieved entirely by the method outlined in this paper, and the principle of treatment should be applicable to other cases:

On the 17th of September, 1898, the patient, a lady fifty-five years of age, consulted me, with the following history:

She had been sick for the past five years with colicky pains in the abdomen, increasing in severity in the last two years, and for the three months preceding the day upon which she called at my office they occurred regularly two or three times a week. The attacks were preceded by a chill, and ended with fever and sweats. An attack often lasted for twenty-four hours; did not end suddenly, and was followed by intense jaundice and pigmentation of the conjunctivæ. The pains were felt in the right

hypochondriac region, and the patient always noticed a swelling there during an attack. Carlsbad salts had been taken every morning for a year. The patient had been at French Lick Springs, and had been under other treatment without relief. She had finally been advised to submit to an operation, but absolutely refused to accept the suggestion. The patient showed a deeply jaundiced skin, deep pigmentation of the conjunctivæ, tongue heavily coated, body emaciated. Temp. 99.5°; no history of constipation, but stools clay-colored. Examination of the abdomen showed a slight enlargement of the liver and tenderness in the region of the gall-bladder. The urine was dark, almost the color of molasses; had a sp. gr. 1032, acid reaction, and gave a marked reaction with the nitric acid color-test for bile. It also showed calcium oxalate crystals microscopically. A gall-stone had never been noticed in the passages, although constantly watched for. The patient presented the typical symptoms of chronic catarrhal cholangitis, and treatment was begun for that condition.

The trouble was brought on by errors of diet, resulting, it was judged, in a chronic catarrhal condition of the stomach and intestines, and affecting the common and cystic ducts by contiguity. In that condition we have a hyperemia and hyperplasia of the gastro-intestinal mucosa, the membrane being covered by a tough, yellowish-white mucus with pus-cells. In very severe cases the mucous membrane is even found mammillated, that is, thrown into folds. It was concluded that one or all of these conditions could be present in this case, and that accordingly a plug of mucus and possibly a fold of the mucous membrane occluded the common duct and imprisoned the contents of the gall-bladder. It was also supposed that in consequence of the retention the bile was in a more or less inspissated condition. The restoration of the gastro-intestinal mucosa to a fairly normal condition should result in the removal of these obstructions, in an increase of the lumen of the common duct, and a release of

the matter imprisoned in the gall-bladder. The final result in this case probably establishes the correctness of this idea.

The patient improved gradually under treatment; the colics were less frequent and of shorter duration, and on the 25th of October the urine showed a sp. gr. of 1010 with only a trace of bile. The feces were dark-colored. By the 12th of November the patient had not suffered with colic for two weeks, but was now troubled with intense itching of the skin upon retiring at night. This was diagnosed as due to a deposit of bile pigment in the tissues. On December 3d the patient had a severe attack of the colic, beginning early in the morning and lasting until 6 P. M. At that time she had an intense pain and desire to go to stool, and then passed the gall-stones that are exhibited in connection with this case. The patient collected the one hundred and thirty-two shown in the bottle, and claims that quite a number escaped from the bowl of the water closet before she realized what had occurred. A few small stones were passed on the succeeding days, but since the 7th of December none have been noticed; the patient has been entirely free from colics; the pigmentation of the skin is disappearing, and her general health is improved in every respect. Upon examining the gall-stones in the bottle it will be found that two of them are very much larger than the others. It is the writer's idea that the cystic duct was occluded by the two large stones, the smaller ones being imprisoned above them in the gall-bladder. It is also concluded that in the beginning the common duct was occluded by the greenish thick mucus that was passed with the feces at times in the early treatment of the case. Treatment was begun with a calomel purge, followed by a saline, and the patient put upon a simple but nutritious diet. She was instructed to drink three large glasses of buttermilk daily, and to increase the quantity as she became accustomed to it. The patient not relishing the other things allowed her, soon consumed a quart of buttermilk daily. The patient drank a glass of hot water at bedtime and upon arising, and with each dose of medicine ordered. In

addition to this, she was instructed to take a hot bath at bedtime twice a week, remaining in the hot water for fifteen minutes. Three times a week at bedtime a high rectal enema of normal saline solution, temperature 110° to 120°, was to be used.

For the attack of colic she was given a mixture containing 2½ grains each of antipyrine and phenocoll mur. to the dose, such a dose to be taken every half-hour with hot water until relieved, the hot bath and rectal injection being used at the time also. In the interval the patient was put upon ten-grain doses of salicylate of strontium three times daily. During the last two months the medication consisted of increasing doses of tr. chionanthus virg., the prescription being varied by the addition at times of one of the tonic bitters, as nux vomica and columbo, again by the addition of arsenite of copper, and in the last month by the administration of nitro-muriatic acid with the chionanthus.

During the last month, on account of the intense itching, the hot baths were used every night.

I ascribe the successful outcome in this case to the fact that the gastro-intestinal tract improved rapidly under this treatment, as shown by the appearance of the tongue. The obstructing mucus in the lumen of the common duct was being gradually removed, if it is correct to suppose that the small masses of green mucus voided with the rectal enemata at times came from that source. Furthermore, on the day upon which these stones were passed the patient had drunk an unusually large quantity of buttermilk, which may have been a factor in the case. She was taking the antispasmodics mentioned before, with the reflex peristalsis induced in the small intestines by the hot rectal enema. Upon examining the stones in the bottle you will find two of them much larger than the rest. It is claimed that the cystic duct was occluded by these large stones, and that after they were forced out the smaller ones escaped with little difficulty.

As to the therapy, the strontium salicylate was given for its antiseptic, antifermentative, and especially for its cholagogue effect, it having the property of not only stimulating the hepatic

cells to increased secretion, but of increasing the fluidity of the bile also, thus offering a *vis a tergo* to the other means used in rendering the biliary passages patent.

Chionanthus virginica is an officinal drug; only four lines are devoted to it in the last dispensatory. It is used extensively by the eclectics, and is indicated especially in lithemic conditions. It was given throughout in combination with one drug or another for its stimulating action upon the hepatic cells, and under its use the feces became darker in color and bile began to disappear from the urine. Arsenite of copper and nitro-muriatic acid were given in combination with one or the other of the above drugs, and the vehicles of course changed frequently in order to keep up the interest of the patient. Every dose of the medicine was taken with a large glass of hot water, and a gradual improvement was brought about in the gastro-intestinal tract, as evidenced by the clearing up of the tongue.

The high rectal enemata were not only intended to cleanse the bowel of fecal matter, but when it is considered that the patient soon was able to retain a half gallon of normal saline solution of a temperature between 110° and 120° from bedtime until the following morning, it may readily be imagined that the moist heat produced by its presence would have a beneficial effect upon all the organs in the abdominal cavity, causing besides a reflex peristalsis that should affect the stomach, duodenum and biliary passages favorably. The hot immersion baths were begun when the intense itching was added to the other symptoms, and not only afforded considerable relief for that trouble, but no doubt also had a favorable effect upon the local condition.

That the diet was an important feature of the case should be evident to every one. It was restricted within reasonable limits, and the use of buttermilk advised. The patient cared but little for the other articles of diet allowed her, and soon subsisted to a great extent upon the buttermilk. On the day on which the stones passed she had consumed an unusually large quantity of it.

Nearly all the text-books recommended morphine in sufficient doses to relieve pain in the paroxysms. It was determined to rely upon other means in this case, as the after-effects of the morphine, constipation, etc., would interfere greatly with the other treatment. The combination of antipyrine and phenocoll muriate was resorted to, and with the rectal enemata readily controlled the pain.

The mortality from cholecystotomy has been reduced to a minimum by the recent advances in abdominal surgery, but the laity has not learned as yet to view these procedures from the standpoint of the surgeon, and so the general practitioner is bound to meet with cases that refuse an operation. In such instances, if it is a case of cholangitis, *i. e.*, the condition leading to the formation of gall-stones, then a cure should follow the means suggested; when gall-stones actually exist, a fair measure of success should result from this treatment.

To the surgeon the writer recommends this precedure as a post-operative treatment in surgical cases to restore the affected parts to their normal condition and thus prevent a recurrence of the ailment for which the operation was performed.

THE TECHNIQUE IN OPERATIONS PER VAGINAM IN DISEASES OF THE UTERUS AND SURROUNDING STRUCTURES.

By William H. Wathen, A. M., M. D., LL.D.
Louisville, Ky.

The popular belief that there is an antagonism between the scientific celiotomist and the vaginal hysterectomist is not justified by facts, for there are many cases that may be treated equally well by either method, and the preference that one surgeon may have for the vaginal route and another for the abdominal route is often largely the result of experience. However, it may be well that we should refer to some of the arguments against vaginal hysterectomy and the treatment of the uterine adnexa, and show that there is no justification for these objections, if the operations are performed by surgeons who are theoretically and practically familiar with the correct technique in such work. My views in relation to what may be accomplished per vaginam have been greatly changed within the last few years, because of a change in the technique previously adopted. Until we learned the advantages in vaginal surgery upon the uterus or adnexa resulting from bisecting the uterus, we could not entirely controvert some of the arguments used to show the superiority of the abdominal route. It is even now claimed that the supra-pubic route possesses an advantage over the infra-pubic route, in that by the former we can see clearly all the diseased structures as we are separating adhesions of the intestines, but that we can not do so by the latter. This is no longer true after bisecting the uterus, which may be done with practically no danger of wounding important structures, and then each half may be separately pulled outside the vulva, adhesions separated as they appear to

the sight and the sense of touch, the diseased structures being seen more distinctly than by any other method. It is impossible to see all the adhesions by the abdominal route when they are extensive and deeply seated in the pelvis, and it matters not what precautions we take to shut off the intestines from the field of operation, and the danger of wounding either the large or the small intestine in such cases is as great as by the vaginal method. Of course I am judging by the relative advantages of these two methods from my experience in operating by both routes. I have never wounded an intestine nor a ureter in the performance of a vaginal hysterectomy or in vaginal incision and the removal of diseased and adherent adnexa; but I have been less fortunate in treating the same kind of cases by celiotomy. Nor is there any force in the argument against vaginal hysterectomy or vaginal incision and removal of the ovaries and tubes of the physicians who assert that we can not do successful work in so-called encysted peritonitis, with the accumulation of pus in the pelvis shut off from the abdominal or peritoneal cavity by an overlayer of agglutinated intestines. These are the cases in which the vaginal method is especially indicated, for we can, by incision and drainage, or by hysterectomy with, and in some cases without, the removal of the ovaries and tubes, symptomatically cure such patients to such an extent that we hear no further complaint of trouble in the pelvis or in the abdominal cavity. This is because of the conservatism of nature in arranging systematically the agglutinated bowels in the effort to protect the healthy peritoneum, and, if left undisturbed, they cause no trouble afterward, and the adhesions are soon softened and can not be detected by a bimanual examination with a finger in the rectum or in the vagina. This has been proven by an abundance of experience, but the evils of separating these adhesions in a celiotomy have likewise been abundantly demonstrated. While a large accumulation of pus in the pelvis may often be sterile, we never know when it is virulent, and then the danger of infection is great, because it is next to impossible to prevent soiling the per-

itoneum and causing septic infection. But granting that the pus is sterile and the adhesions are all separated without wounding an intestine, and the patient makes a prompt recovery from the operation, she is left in an incomparably more dangerous condition than she would have been had the operation been performed from below and the adhesions not disturbed. Post-operative complications in supra-pubic incision arise in these cases so often that we can not believe it is possible for such extensive adhesions to be separated without the recurrence of irregular adhesions, more complicated and more dangerous than the adhesions systematically formed in nature's effort to protect the life of the woman. The objection to vaginal hysterectomy because of the danger of encountering a diseased appendix which can not be removed from below is not worthy of serious consideration, because if an appendix is sufficiently diseased to justify its removal, then the present or past symptoms would attract attention to appendicitis and indicate the necessity for a celiotomy. But as other members may discuss more thoroughly the objections urged against vaginal hysterectomy and vaginal incision, etc., I will confine my remarks to a few minor points in the technique that enables the operator to overcome the difficulties more easily. In the first place, no one can successfully controvert some of the arguments against vaginal hysterectomy unless he recognizes the necessity for and practices bisection of the uterus before separating the adhesions of the ovaries and tubes. Again, most operators use too many instruments, which complicate and confuse instead of being a benefit. In nearly all published illustrations demonstrating the methods of performing vaginal hysterectomy, or any form of surgery upon the vagina, the uterus, or its adnexa, we found four retractors introduced; one anteriorly, one posteriorly, and two laterally, none of which is often of any benefit, and all combined result in a complication that may prevent perfect surgery per this channel. There is never use for a retractor in treating diseases of the adnexa by incision through the vaginal vault, and there is no use for more

than one in vaginal hysterectomy, and in most cases all may be dispensed with. The advantages and simplicity resulting from dispensing with retractors are so striking that persons who have previously used several retractors can hardly understand why they did so. While the danger of wounding an intestine or the ureter in removing the adnexa per vaginam by vaginal incision is greater than where we first bisect and remove the uterus, it may be so minimized as to be practically of no consequence. I claim no excellence in this work over any well-trained surgeon in vaginal hysterectomy, and what I have accomplished any one else may accomplish.

In all forms of tubal pregnancy before the end of the third month, before or after rupture, unless there is a great accumulation of blood in the abdominal cavity, the ruptured tube may be removed per vaginal incision with nearly perfect results. Of course it would not be the correct thing to attempt to complete an operation for intra-peritoneal rupture in extra-uterine pregnancy per vaginam where the abdominal cavity is filled with blood, but vaginal incision is often of great value even in these cases. It is well known that the primary hemorrhage is sometimes so extensive as to result in shock that, for the present, contra-indicates celiotomy. In these cases the custom has been to temporize until the shock may have been sufficiently combated to justify celiotomy. But often, just as the pulse becomes well perceptible, secondary hemorrhage speedily causes death. In these cases secondary hemorrhage can be positively prevented without materially endangering the life of the woman by increased shock. If she is too feeble to bear an anesthetic, then a vaginal incision may be made without it, the ruptured tube pulled into the vagina, clamped with a small forceps, and left in the pelvis until the patient is prepared for a celiotomy.

During the last four years I have operated per vaginam many times for extra-uterine pregnancy, all the patients having recovered without a complication or bad symptom.

My experience and observation justify me in the belief that most of the objections now urged against vaginal hysterectomy are nearly identical with the objections urged against this method by the Paris surgeons when first practiced by the late Pean, but it is well known that these very men are more enthusiastic than was Pean, their objections having gradually faded away as they watched the results of the work of this great surgeon and the results of operations performed by themselves. They believed then, as many of our surgeons believe now, that there is no conservatism in surgery per vaginam, while the most earnest advocate of the infra-pubic method knows that by this method he can perform more conservative major surgery than by any other method. If he can not positively decide whether one or both tubes should be removed, an exploratory operation is demanded; and what could be more simple than a vaginal incision into Douglas' pouch, through which the structures around the uterus and up to the pelvic brim may be examined, and adhesions separated, and the ovaries and tubes brought into the vagina, removed if necessary, or, if not diseased enough to justify removal, treated after any approved fashion, one or both returned into the pelvis, and the incision sutured, with a mortality that is nil, and no scar or danger of hernia be left. Theoretical arguments against any method of operating can not be of value when disproved by intelligent experience and observation. I have frequently been told that it is impossible to remove the appendages through a vaginal incision, or to remove the uterus without the use of speculums or retractors, without greatly endangering important ogans. But of what value is this, when I am constantly doing this work without meeting any of the dangers complained of? I do not recognize as a fact that the uterus is an important organ after the ovaries and tubes have been removed, but there are instances where it should not be removed. In these cases the patients may often be restored to health by treating the adnexa through a vaginal incision.

The formation of abscess in post-puerperal infection may be prevented if diagnosed in its incipiency. If the infection be confined to the cellular tissue in the folds of the broad ligaments, the inflamed area may be drained by vaginal incision and separation of the folds, without opening the peritoneum; but usually the inflammation will have extended to the pelvic peritoneum, and then the pouch of Douglas should also be opened and all adhesions separated, and in either event the infected surfaces should be kept apart by gently placing gauze, to which may be added a fenestrated gum tube, to insure perfect drainage.

In operations for removal of pus in the pelvis, and its associated pathological condition of structures, it is unnecessary to consider its etiology, the treatment being nearly identical in post-puerperal infection following labor or abortion, or gonorrheal infection, or in cases where we find the pus caused by the streptococcus, the staphylococcus, or the gonococcus, etc.; but where the infection is the result of the germs of putrefaction, the treatment must vary. Pus in the pelvis or the tubes or ovaries can usually be treated from below, and any thing can be accomplished per vaginam that can be accomplished by abdominal section, except the separation of an overlayer of adhered intestines, and this should not be interfered with from either below or above. The cases in which the complications cause a great mortality in abdominal section nearly all get well after an operation per vaginam.

GUNSHOT WOUND OF FEMORAL ARTERY: LIGATION: RECOVERY.

By H. K. Adamson, M. D.
Maysville, Ky.

Traumatic wounds of the larger arteries are of especial interest, both on account of the frequency of their occurrence and the seriousness of their results. While we shall not attempt to enter largely into a description of this class of injuries, still we desire to give an incomplete report of a case that lately came under our observation, believing that it possesses some features of interest, especially as to the length of time sometimes permitted to intervene between the date of injury and that of operative interference without causing the death of the patient. On January 5, 1899, we were requested by a brother physician to see John H., colored, age forty, who gave the following history: On the night of November 27, 1898, he received a wound from a No. 38 Smith & Wesson revolver, the ball entering the right thigh on its anterior surface three inches below Poupart's ligament, passing downward and inward, and lodging on the inner side of the thigh two inches above the knee-joint. There was very slight hemorrhage from the wound, but in an hour the thigh was markedly swollen but free of pain. He was put to bed in a room twelve by eight feet with a very low ceiling and one window, and had been seen daily by his physician. When we saw him he presented the following condition: He was emaciated, his countenance showing that peculiar ashy appearance so often seen in a very sick negro. His pulse was 128, respirations 26, temperature 102¾°, tongue dry and brown, and teeth covered with sordes, bowels constipated, with urine highly colored. His leg was greatly swollen from the hip-joint to the end of the toes, the

integument above the knee being tense and dry, the wound made by the entrance of the bullet completely healed. Below the knee the swelling was not so marked, but on the outer aspect of the leg, midway between the knee and ankle-joint, there was an opening to an abscess from which there was a profuse discharge of exceedingly fetid pus, with some particles of gangrenous muscular and membranous tissues. This opening had taken place five days previously, at which time the discharge of pus had been so profuse as to run over the side of the bed to the floor. Not seeing much that was inviting in his condition, and it being late in the evening, we concluded to let him alone until morning, at which time we would remove the ball, enlarge the openings of the pus cavities, and do some thorough washing. When we saw him the next day his condition was about the same as the evening before. Thinking that we had pus in the limb above the knee, from the fact that it existed below it, we decided to remove the ball and leave a free opening for purposes of drainage and irrigation. Before proceeding we introduced the exploring needle in three or four places, and, very much to our surprise, drew off blood instead of pus. At this point we realized that we had a concealed hemorrhage to deal with, and, placing a rubber tourniquet loosely around the upper part of the thigh, we thoroughly cleansed the limb with hot water and soap, followed by a liberal washing with alcohol. After injecting ten minims of a four-per-cent solution of cocaine, we cut down and removed the bullet without any escape either of blood or pus. Introducing our fingers into the wound they came into contact with a well-organized blood-clot, which on removal was followed by a perfect gush of arterial blood that drenched the bedding and painted the wall. Realizing that we had the femoral artery to deal with, we immediately made a firm constriction around the thigh with the tourniquet, thus checking the hemorrhage, but not until the loss of blood had been excessive. Being alone and not being able to see or feel the bleeding vessel, the wound was packed tightly with borated gauze, a firm compress put over it, and these

held by a cotton bandage firmly applied. Removing the tourniquet and finding that there was no further bleeding, we left the patient until the following day, when he was seen by Dr. A C. Browning with us. The removal of the dressing was immediately followed by the same severe hemorrhage, but it was checked by the tourniquet and the wound repacked as before. Being now thoroughly satisfied that an operation was necessary, we took up the question of what operation should be done. Amputation in the upper third of the thigh or hip-joint did not seem inviting, as we believed that because of the extremely weak condition he would either die during the operation or from the shock following. Neither did the ligation of the femoral artery present many attractive features, as it seemed that on account of the extensive suppurative process going on in the lower leg, extensive gangrene would probably follow. The latter, however, was decided upon, and on January 9th, assisted by Drs. Harover and Yazell, we did the following operation:

The patient was put under the influence of chloroform; all articles of furniture and carpets were removed from the room; the limb was thoroughly scrubbed with soap and hot water, and then washed with alcohol. Placing the tourniquet around the thigh as high up the limb as possible, and removing the packing from the wound made at the time of the removal of the bullet, we introduced our left index finger, and, using it as a guide, we laid open the thigh for a distance of nine inches before coming to the wounded vessel. On exposing the artery it was found that instead of being completely severed by the ball a segment 1¼ inches long had been cut from the anterior and internal surface, leaving less than one-half of the wall of the vessel intact. It was then separated from the vein and a ligature of sterilized silk applied. It was found that the blood had dissected up and separated the muscles of the thigh through its entire length, and with our fingers we removed about three pints of coagulum, no pus, however, being encountered. After washing out the wound thoroughly with a hot saturated solution of boric acid, it was

packed with borated gauze and the tourniquet removed. No hemorrhage appearing, the patient was given a hypodermic of strychnia and digitaline, put into bed, and hot bottles applied to the body and extremities. He came from under the anesthetic fairly well, and was ordered two ounces of whisky every four hours, with a liberal supply of milk and eggs. The daily washing of both wounds with the boric acid solution was the only treatment given then.

On January 15, 1899, gangrene appeared in the great toe and slowly extended up the foot until it reached the ankle-joint, where the line of demarcation was distinctly formed. For four days following the ligation the temperature was 97.5°; after that it reached normal, but never went above it. Having now the gangrenous foot to dispose of, he was, on January 27th, put under the influence of chloroform, and, with the assistance of Drs. Harover, Yazell, and Pangburn, the leg was amputated just below the tubercle of the tibia. We were extremely anxious to save the knee-joint, and, in order to do this, we were forced to amputate through the large pus cavity that existed in the leg; the flaps were turned back, cleansed of pus and an offensive gelatinous matter by scraping with the handle of the scalpel. The stump was well washed with antiseptics, the flaps were closed one-half of their length, and the wound packed with gauze. The patient stood the operation well, coming from under the influence of the anesthetic in a good condition.

From this time on the treatment was simply that of keeping up the strength of the patient with a liberal supply of nutritious food and as much stimulant as he could stand. The wounds in the thigh as well as the cavity of the stump were washed out daily with boric acid and packed with borated gauze. Suppuration was profuse in both wounds, but no symptoms of constitutional infection appeared at any time. Granulation of the wounds proceeded slowly, and on March 10th he was discharged cured. Since then he has fully regained his flesh and strength, the action of the knee-joint is perfect, and he is at work at his trade, that of a cement pavement builder.

SUPRARENAL EXTRACT IN THE TREATMENT OF ADDISON'S DISEASE (CLINIC).

By R. Alexander Bate, M. D.
Louisville, Ky.

This case was reported at the Louisville Society of Medicine and referred to in a paper upon "Animal Extracts," read before this Society at Maysville.

The following history is taken from the notes of the case, made about two years ago when the patient first came under observation: Mr. C., aged fifty-four years; occupation, teamster; family history good, with the exception of one child's suffering from epilepsy. Upon physical examination it was observed that the skin of the body and limbs was of a lemon-yellow color; face and hands dark bronze, mucous membranes of the mouth and conjunctivæ brownish-red, and the hair was black; there was tenderness over the epigastric and lumbar regions; both kidneys were elongated and tender; there was also epigastric pulsation due to a cylindrical aneurism of the abdominal aorta.

There was a history of continuous epigastric and lumbar pains, occasional aching in the joints, and frequent spells of faintness without loss of consciousness; enfeebled strength with constant weariness. Diarrhea would occur without any assignable cause, and would be very persistent in its course; there was nausea at times, and the mouth constantly filled with slime. Pains extending from the epigastric region downward over both iliac arteries and upward, especially toward the left arm, were considered dependent upon the aneurism.

The urine was voided frequently, color bright red, of acid reaction, containing uric acid in proportion to urea of 1 to 43; also

uroerythrin, melanin, biliary coloring matters, and indican in excess. In this case the aneurism has been recognized for the remarkable period of thirty-five years.*

At the age of fourteen the patient felt something give way in the abdomen while straining to save his father from being crushed by a log. In addition to the aneurism there is a history of traumatic injury, having occurred about twenty-six or twenty-seven years ago, that caused depression of the sternum just above the xyphoid cartilage.

The pathology of morbus Addisonii is still very uncertain, but in this case it is susceptible of but two explanations. Either the blow causing depression of the sternum deranged the semilunar ganglia, or, at least, the suprarenal plexus, interfering with the action of the sympathetic, which is tonic to the blood-vessel walls, causing rhythmical contraction, and thus permitting dilatation of the vessels, with consequent congestion of the suprarenal bodies. Or the aneurism may not only act in this same way, but can press directly at least upon the left adrenal. Thus both functional and morbid changes in the suprarenal glands can be understood. So that the symptoms of Addison's disease can be seen to occur from a deficiency of suprarenal principle in the system, no matter whether the glandular inadequacy is dependent upon functional or morbid changes.

Consequently, upon isopathic principles, this patient was put upon the suprarenal extract, and a prognosis favorable concerning the Addison's disease was given.

One twelfth of a grain of the extract of suprarenal glands of sheep was administered three times daily. This has been kept up more or less constantly ever since, and for the past year the patient has been able to earn his living at his usual occupation. The asthenia, nausea, dizziness, faintness, and pigmentation have almost entirely disappeared. The pains produced by the aneurism of course still remain, though somewhat lessened, most likely from potassium iodide, which was administered for that purpose.

* Dr. Kalfus, now deceased, diagnosed aneurism in 1864.

Upon two occasions, when the suprarenal extract could not be obtained within ten days, attacks amounting almost to syncope occurred; there were cold, clammy sweats and muscular twitching, followed by slight fever and a bounding pulse, averaging about ninety beats per minute, and there was a general feeling of approaching dissolution. The extract has apparently been almost specific in this case. Of course should the medication be discontinued the symptoms will return, since we have simply supplied artificially that which is normally secreted.

This drug should be as nearly specific in exophthalmic goitre as in Addison's disease, since it is the true antidote to thyroid extract. It is indicated in all conditions attended by loss of muscular power, probably in the same cardiac derangements in which digitalis is used—in subnormal temperature associated with asthenia, in anemia and melanemia, in neurasthenia and conditions requiring vasomotor stimulants.

At the risk of being tedious this case is again brought before the Society, believing the results obtained justify repeated efforts to extend the use of this most valuable agent so generally viewed askance.

DISCUSSION.

Dr. Frank C. Wilson, Louisville: I remember in looking over this case that it was exceedingly interesting. There was considerable discoloration. I was interested much in the abdominal pulsation, and in the question whether there was a distinct, unmistakable aneurism or not. There was certainly a pulsating tumor in the course of the abdominal aorta. It would seem strange, of course, that an aneurism should have existed so long, the tumor having been suspected or diagnosed as much as thirty-five years previous. The tumor seemed to be extensive, pulsating, and I was satisfied that there was a certain amount of aneurismal enlargement; it seemed to me rather of a fusiform character than as a distinct sac on the abdominal aorta. This was in the neighborhood of the suprarenal capsules, and undoubtedly had much to do with the symptoms from these; that is, the pressure from this mass may account for many of the symptoms presented. The result has certainly justified the recommendation of the

extract of this gland, and it certainly should interest the profession at large.

Dr. THOMAS H. STUCKY, Louisville: I am thoroughly familiar with this case, and I want most heartily to approve of the results obtained by the essayist, and to compliment him upon these good results. The question that concerns us most in the management of cases of this type is an established value of the animal extracts in these various organic deficiencies. Those of us in general practice who have had to deal with the patient after leaving the surgeon for double oöphorectomy have all experienced in the neurasthenic type, which frequently follows, the wonderful value of the ovarian extract in controlment of this condition of neurasthenia. We also have been able to observe the benefits of the testicular as well as the thyroid extracts. My experience in the use of the suprarenal extract has been limited to only two cases. In both cases I believe the deduction may be safely made, that the extract has been of marked therapeutic value. Whether this is due to the supplying of a deficiency or not I am not prepared to say, but I am prepared to say that in the vast majority of cases where the animal extracts are used, and there is a deficiency in the secretion of the organ for which they are used, there is an established physiological benefit. I believe the therapy of the future largely lies in the enhancement of the use of the animal extracts in a field far larger than that which they now occupy. I believe this case had an aneurism, and that it was fusiform in character. You all recognize the factors, excluding traumatism, that play such an important part in the production of aneurism. Whether there is a history that would be of importance we do not know. But it seems that this thing, in which we have heretofore obtained such miserable results, is going to yield to modern therapy.

THE ETIOLOGY AND TREATMENT OF CROUPOUS PNEUMONIA.

By Frank C. Wilson, M. D.
Louisville, Ky.

Pneumonia, known from the days of antiquity and studied by a long line of distinguished observers, is to-day almost as great a scourge of the human race as is tuberculosis.

It has been estimated that 3 per cent of all the diseases on the face of the globe are due to this cause, and that about 6.6 per cent of the total mortality can be ascribed to pneumonia. The importance of a careful study of this subject can not be overestimated.

The limits of this paper will allow consideration only of the etiology and treatment.

Pneumonia may be defined as an inflammation of the lung substance, characterized by a plastic or croupous exudation filling the air-cells, accompanied by severe constitutional symptoms, and running a definite course through its several stages, each marked by well-defined rational symptoms and physical signs.

Latitude seems to exert very little influence as a predisposing cause, pneumonia being even less frequent in the extreme north than in the tropics. Sudden changes of temperature and the relative moisture are much more potent factors. High altitudes seem to predispose to it.

Age must be admitted as having some influence, the cases being more frequent in early childhood and after the age of sixty-five.

Loomis states that lobar pneumonia is five times more frequent in the first two years of life than in the succeeding

eighteen. He also states that nine tenths of all deaths after the sixty-fifth year are caused by lobar pneumonia.

The male is more frequently attacked than the female, probably because more exposed.

Pneumonia is very liable to occur in those whose constitution has been enfeebled by disease or dissipation, which exhausts vitality and diminishes the resistive powers of the system. Diseases of the heart producing pulmonary congestion and traumatic injuries of the chest are predisposing factors.

The infectious nature of pneumonia was first advocated by Jurgensen in 1872. The occurrence of several cases in quick succession in the same family, traceable to attendance upon previous cases, or the existence of cases so numerous in a community as to be called epidemic, suggested strongly the infectious character of the disease long before the discovery of the micro-organism.

In 1875 Klebs claimed to have found the infecting agent—the monas pulmonale—which, inoculated, would develop croupous pneumonia.

In 1879 Sternberg discovered in the saliva a microscopic germ which, inoculated in animals, produced pneumonia

The presence of a special organism in the pulmonary exudation was demonstrated by Friedlander in 1883 as the pneumococcus, and again by Fraenkel in 1886 as the diplococcus.

Weismayer found in thirty-nine cases of pneumonia the diplococcus of Fraenkel in thirty-four, and in two of these the streptococcus was also present, while in three cases the streptococcus alone was present in the sputum.

W. H. Welch found it in every one of ten cases studied at Johns Hopkins Hospital.

A. M. Pierce, in a study of one hundred and twenty-one cases of lobar pneumonia, found the pneumococcus in one hundred and ten, while in eighty-four it was the only micro-organism present.

Wolff, in the examination of seventy cases, found Fraenkel's diplococcus sixty-six times.

Banti found the diplococcus in every one of forty-seven cases of fibrinous pneumonia.

Treatment. Assuming the infective nature of the disease and that the germ passes out with the sputum, danger to those around the patient will be greatly lessened by thorough destruction by fire of every particle of expectoration. The importance of this is just as great as in the case of tuberculosis.

Foa claims to have obtained immunity against pneumonia by injecting an attenuated culture of the diplococcus of Fraenkel. Huber and Blumenthal found that the blood filtrate from pneumonia protected rabbits against infection with the pneumococcus. It is still an open question whether in a disease that not only does not protect against subsequent attacks, but rather seems to predispose to them, immunity can be secured by injecting the appropriate antitoxin.

In the case of diphtheria, where the conditions are very similar, many observers concede the immunization power of moderate-sized injections of antitoxin, while, just as in the case of pneumonia, one attack really predisposes to subsequent attacks.

The question naturally arises as to the possibility of arresting the inflammation within the first few days of its inception. It is seldom that the physician sees the case in the first twenty-four hours, so that generally it has to run its course of seven or eight days, merely guided to a successful issue by the efforts of the observer. If, however, he sees it in the first stage, that of congestion before exudation has actually taken place, can it be aborted by any therapeutic means at our command?

I have for more than twenty years been in the habit of using for this purpose a combination of ergot and salicylate of soda, and I believe that I have succeeded in numbers of instances in causing the rapid disappearance of all the rational and physical signs of the first stage of pneumonia in cases that, as far as I

could judge, did not differ in one iota from other cases that passed through all the stages of the disease.

The ergot was given with a view of relieving the congestion, while the salicylate acted as a defibrinizing agent as well as a germicide.

Van Schaich has used ergot successfully, and he states that it relieves the symptoms of pulmonary congestion more rapidly and effectually than any other therapeutic measure; that it may cause a limitation of the area involved by the pneumonic process, and that in some cases it may possibly arrest the progress of the disease.

Pacenotti found that the pneumococcus can live in the blood, producing the changes both in the blood and sputum by reducing and decomposing the hemoglobin.

Possibly the congestion of the involved lung may be a condition necessary for the development of the germ, and when this is relieved by the ergot it may to that extent arrest development of the germ.

The action of ergot is first exerted upon the muscular coats of the small arterioles that supply the congested area, and by cutting off the blood-supply relieves the congestion.

Dr. Becker states that for two years he has treated pneumonia with salicylic acid, and has distinctly favorable results. He thinks that the salicylic acid acts partly as an antiseptic and partly by aiding nature in breaking up the exudation and liquefying it, the sputum increasing and becoming more liquid.

R. Leigel has used large doses of sodium salicylate in pneumonia, and believes that he has distinctly modified the disease.

There was no crisis in any of the cases, but the temperature fell within two days.

Sebring, in the Journal of the American Medical Association, April 29, 1899, speaks very highly of the use of salicylate of sodium in pneumonia, giving it in doses of eight or ten grains every two hours. He finds from Blumer, of Albany, that the drug is fatal to the pneumococcus in five minutes in a one-per-cent solution, and suggests that possibly pneumonia

may be regarded as an acute pulmonary inflammatory rheumatism, plus an infection of pyogenic bacteria.

I have for a number of years past, in lecturing upon pneumonia to the classes of the Hospital College of Medicine, advocated the effort to abort the disease by means of ergot and salicylate of soda when seen within twenty-four hours of its inception. If successful in twenty-four or forty-eight hours, you have saved the patient a serious attack. If unsuccessful and the pneumonia passes into the second stage, you have lost no ground, and you have not injured in the least your patient's chances, and you may go on with other methods of treatment as you may select. I am satisfied that even when unsuccessful in cutting short the disease this plan of treatment may at least limit the extension of the exudation and render it more easily liquefied in the stage of resolution.

Since the discovery of the diplococcus, efforts have been made by various observers to produce an anti-pneumococcus serum.

J. W. Washbourne produced in 1897 a serum with which he treated six cases of pneumonia, all of whom recovered. Pane and deRenzi, of Italy, also produced from animals a serum with which they treated a series of cases of pneumonia with remarkable success.

Dr. A. Fanoni, an Italian physician of New York, writes me that he has used the serum made by Pane and deRenzi in a number of cases with remarkably good results, the fever diminishing, the pulse and respiration declining, and the patients feeling relieved.

Charles Jansson treated ten cases of pneumonia by injections of heated pneumococcus cultures.

Lichtheimer used blood serum from a man who had but recently recovered from an attack of pneumonia. Transfusion of blood from convalescent cases in the treatment of pneumonia is reported by Hughes and Cartor. Huber and Blumenthal treated fourteen cases of pneumonia with the serum of blood from convalescents, with two deaths. In four of the cases there was a marked decline following the injection, and the general condition improved distinctly.

Dr. G. Stokes, in the British Medical Journal, claims that oxygen alters or profoundly modifies the toxines of some microbes, retarding their growth, as in the case of the diplococcus of pneumonia. He also asserts that its use lowers the temperature of the body.

Foa obtained immunity against pneumonia by injecting an attenuated culture of the diplococcus of Fraenkel.

The blood filtrate from pneumonia has been found to protect rabbits from infection with the pneumococcus.

That lobar pneumonia, if uninterrupted in its course, passes through its three stages in seven or eight days with a tendency to recover I think can not be disproved. The duration may be prolonged by the invasion of another lobe when the first is half through its course, and even a third may in turn become involved. As the chief danger to be apprehended is from heart-failure, efforts must be directed to guard against this by the judicious and even heroic use of stimulants and heart-tonics whenever indicated by the character of the pulse.

The patient's strength must be conserved by absolute rest in bed, avoiding all unnecessary exertion. If the cold applications are not used, the chest should be surrounded by the oil-silk and woolen or cotton jacket.

To support the heart's action nothing answers so well as full doses of strychnia administered hypodermatically. Digitalis and strophanthus are valuable adjuvants. Carbonate of ammonia, in doses of five to ten grains every four hours, acts not only as a diffusible stimulant but as an expectorant, and alcohol in the form of whisky or brandy can seldom be dispensed with. Opiates are not needed, unless there be severe pain from a complicating pleurisy.

If a large part of the lung is involved so that cyanosis is imminent, the inhalation of oxygen gas may be resorted to with the hope of increasing the amount absorbed above the minimum necessary to maintain life, until such time as resolution may be established. This result is indicated by the decline in temperature, respiration, and pulse, and confirmed by the physical signs.

TREATMENT OF LOBAR PNEUMONIA.

By John G. Cecil, M. D., B. S.
Louisville, Ky.

A more correct title for this paper would be "The Treatment of a Patient Suffering from Lobar Pneumonia." Since the classification of lobar pneumonia as an infectious disease, and since no specific treatment has yet been devised, it is hardly proper to speak of treating pneumonia. It is in the nature of this disease to run a definite course, practically uninfluenced by any treatment; accordingly the sooner our therapeutics is raised to the level of our pathology the better it will be for the patient. Notwithstanding the truth of the foregoing statement, it must not be inferred that nothing is to be done; on the contrary, there is very much that may be done, only let our attention be directed to the patient and not to the disease. While the course and termination may be regarded as fixed, the conditions existing at the time of attack will certainly modify them in a most decided manner.

"In the treatment of pneumonia it is essential to recognize that, though the disease may be a unit from a pathological standpoint of view, therapeutically it comprises essentially diverse diseases.

"A pneumonia whose physical signs can not be made out in the beginning, but gradually creeps up toward the chest-wall; a pneumonia whose expectoration is in the beginning prune juice; whose crepitant râle is never typical; whose physical signs are obscure until complete consolidation gives percussion dullness; or a pneumonia occurring in the alcoholic, in the old, in the victim of renal disease, in the broken-down debauchee, in the worn-out city merchant or professional man, is in its management essentially distinct from a pneumonia the result of exposure of a

strong, healthy countryman to a Western blizzard or other cold. In one form of pneumonia sedative treatment may kill the patient; in another form sedative treatment at the beginning of the attack may be necessary for the saving of the patient." (Wood & Fitz.)

Attention will be asked first to the sthenic type of the disease.

In the young, healthy individual the management of pneumonia resolves itself practically into making the patient as comfortable as circumstances will admit of. A good purgative dose of calomel to start with will anticipate and prevent much subsequent discomfort.

For pain, which varies according to the extent of pleurisy, small doses of morphine or its equivalent in other preparations of opium will afford the surest and safest relief. The objections to the use of opium in lobular pneumonia and in the asthenic type of lobar pneumonia does not hold in the management of the variety of pneumonia now under consideration. Opium not only quiets pain, but it allays the cough, which is often harassing and never of much benefit. A very small proportion of the fibrinous exudate is disposed of by cough and expectoration. There is therefore no danger of seriously interfering with excretion through this source. The small dose of morphine tranquilizes the patient, gives rest and sleep, does not interfere with the progress of the disease, and answers every purpose of a cough medicine. A single dose of one-eighth grain of morphine given at bedtime is generally sufficient. Pain is also combated in a successful way by the use of the ice-bag, which is a great improvement on the time-honored hot poultice.

The fever of pneumonia, even when it rises to 104° or 105° F., is not necessarily such a bad indication; it demonstrates a resistance that is very desirable and very essential to successful issue. The course of this fever is short, and, even though a high grade is maintained, it need not be fought with the same zeal that fevers of longer duration demand. The ice-bag to the affected side exerts a good influence in reducing temperature as well as in relieving pain.

Hyperpyrexia can be controlled by cold sponging or the cold pack. The coal-tar derivatives have no place in the management of this or any other kind of pneumonia. Veratrum viride, aconite, and phlebotomy are indicated in just such cases as demand no treatment at all, consequently can hardly claim a place in the therapeutics of pneumonia. Their action is to depress the heart; certainly no specific action can be claimed for them. If lessening blood-pressure by their use is the intention, we have better and safer means at our command.

The pathological condition confronting us is certainly not materially altered by slowing the pulse. If the heart maintains a steady ratio to the height of fever, neither heart-tonics, stimulants nor sedatives are very essential. Should, however, a tendency to heart-failure, generally first shown by loss of accent to the second sound, manifest itself, the indication for tonics and stimulants is plain, and they should be exhibited for effect, regardless of dose. A heart action that gains in rapidity day by day, independent of variations of temperature, is of serious import, and should awaken the most active resistance. The key to the successful management of pneumonia lies in the wise and judicious adjustment of therapeutic agents to meet a progressively failing heart. Of all agents for this purpose whisky and strychnine are the most reliable. Strychnine should always be given hypodermatically, the dose repeated every three or four hours; should vary from one-sixtieth grain to one-tenth grain; the effect alone should determine the size and frequency of the dose. Whisky is best administered without sugar in plain or aerated water, one, two, or three hours intervening between doses. In nitro-glycerine, as a diffusible stimulant and adjunct to whisky, we have a valuable agent. It enables us often to tide the patient over a critical period. Much distrust as to its value has arisen from unreliable preparations. Its action is rapid; its effects quickly disappear. The dose should therefore be quickly repeated.

Digitalis is inferior to strychnine as a heart-tonic; the overburdened heart is more certainly relieved by dilating the per-

ipheral capillaries and inviting the blood into them. This is what is done with whisky and nitro-glycerine.

In cases of extensive involvement of the aerating space with marked cyanosis we have in oxygen gas a remedy of great usefulness; its administration will help to carry many a one over a rough place and enable him to reach and pass in safety the crisis. The use of it should not be delayed too long, nor should the apparent hopelessness of the case ever be used as an argument against it.

The feeding of a pneumonic patient is of no little importance; he is far more likely to be overfed than to be underfed. These patients are seldom if ever hungry; more often they have no appetite at all, consequently digestion will be a very uncertain problem.

Indigestion resulting from forced feeding favors the accumulation of flatus in stomach and bowels, which in turn embarrasses the heart and lungs in their action.

Meat broths and milk with aerated waters should constitute the regimen. Solid food, eggnog, and milk punch are not desirable, and should be forbidden. There is no danger of starvation in the short course of this fever, and little can be done to maintain strength by giving of food during its activity.

A word as to examinations of the patient. Having made the diagnosis, frequent examinations during the progress of the case are both unnecessary and injurious. To turn the patient over is annoying and painful; to raise him to a sitting posture is dangerous and needless. The course and progress of the disease can be determined without daily or bi-daily examinations, and even though new areas are being invaded the management will hardly be varied. The heart's action, the rapidity of respiration, and the distribution of pain will usually give all necessary information without frequently-repeated examinations.

The management of lobar pneumonia in the healthy and robust resolves itself into practically a do-nothing policy; make the patient comfortable, relieve pain and cough with an opiate

and the ice-bag. Sponge with cold water for excess of fever, do not force the feeding, and do not harass by frequent examinations. Watch the heart with jealous care, and be ever ready with tonics and stimulants at the first sign of failure. For delirium and sleeplessness apply cold to the head. Do not overfeed, do not overtreat, do not meddle.

The management of pneumonia in the aged, diseased or dissipated is an entirely different proposition. The fight begins with the initial symptoms of the attack, and every energy is bent on sustaining the already crippled heart. The policy must be prompt, active, and alert. To guide these patients over the crisis calls for the most constant and watchful care, and will tax to the limit the skill of the therapeutist. No disease requires more skill and attention in the nursing, and the services of at least two faithful and skillful nurses will be demanded. A successful issue in such a contest is a feat to be proud of and one scarcely equalled, never surpassed, in the realms of medicine or surgery.

The chief aim in the management of such cases will be to sustain the heart; the agents at our command are practically identical with those used in the threatened heart-failure of sthenic cases. Opiates may be necessary to relieve pain, but their administration and dosage must be most wisely adjusted. Small doses of morphine, repeated as the occasion may demand, will be safest and most efficient.

It is only when fever is excessive that it requires any attention whatever. Much oftener will it be found that the temperature will be comparatively low, indicating a lack of resistance—a very unfavorable indication. The application of cold in any form as a rule is not well borne, and other antipyretics are out of the question.

Delirium, which is very constantly present, is best met by the use of stimulants, as brandy, whisky, or caffeine. No medicine of depressing character is at all admissible.

Strychnine, digitalis, nitro-glycerine, strophanthin, cocaine, and atropine comprise the medicinal agents for combating heart-

failure. They should be given solely by the needle. Their administration should be determined by the effect, and should be under the immediate supervision and direction of the physician himself.

The whole question of feeding is of secondary importance; it is better to leave off food of all kinds and preserve the stomach in its integrity for such stimulants as whisky and brandy.

The amount of whisky that may with advantage be given will be largely determined by the ability of the stomach to digest it. Oxygen gas will often prove of incalculable benefit; it should be used early and persisted in until the last ray of hope is gone.

After all, and in the face of all efforts, let them be never so prompt, never so wise, never so assiduous, pneumonia in this class of patients will ever remain the most destructive and deadly of all common acute diseases, and the winner of these hard-fought battles may be justly entitled a wise and a good physician.

DISCUSSION.

Dr. George W. Beeler: I have no criticisms to make on the papers read by Dr. Wilson and Dr. Cecil. Those papers are conservative. There are a great many things I would recommend with which I have had experience. But I want to say this, gentlemen, that when I began the practice of medicine the treatment was blood-letting and later blistering, and still later the use of veratrum viride. I have bled hundreds of patients with pneumonia and pleuro-pneumonia, and I can say that my experience with tartar emetic and the lancet, too, was a good one. After years of experience along that line there came to be considerable opposition in the schools by leading professors to the use of tartar emetic, bleeding, and blistering. It was easier to follow their teaching. So I have not bled a patient for a long time. But I would not hesitate to bleed if I had a case demanding it. I have bled patients seventy years old and over, and they recovered. And, gentlemen, when I practiced that system I was more successful than of later years. A paper was read at Shelbyville a few years ago, in which a doctor spoke of the pneumonic germ and the modern treatment, the supporting treatment, the stimulating treatment, and all that. And in the wind-up he said that he remem-

bered under the old treatment of blood-letting, tartar emetic, and blistering the percentage of recoveries was much larger; it occurs to me that he said the proportion was about 17 to 18 per cent. In regard to salicylate of soda and ergot, I have never had any experience with them. I should suppose the salicylate of soda would be a good remedy; it is an antipyretic. As to the coal-tar preparations, I agree with the gentlemen who have preceded me; I would not give them. Some years ago I had five cases in one family, and I am inclined to believe in infection, because I had these five cases in one family, and they were all followed up with malaria. Quinine was scarce, and we used cinchonidia a great deal as a substitute. To those cases I gave cinchonidia, Dover's powder, acetate of potash, and muriate of ammonia, and they all got well. I am satisfied of one thing, that we used to bleed a great many patients who would have recovered without blood-letting. And I am satisfied, too, that we now often lose our patients because we fail to deplete.

Dr. F. J. YAGER, Campbellsburg: Dr. Beeler tells you strictly and strongly that he doubts very much whether there have been as many cases saved by the modern methods of treatment according to the number of cases treated. When our country here was full of timbers and damp air and malaria, and all the materials which bring about such a result as pneumonia in the human body, that disease was more prevalent, and I doubt very much whether they have the success now that we had in the days of old. I remember that I hardly had a case of pneumonia but I would feel disposed to take out my lancet and pierce the vein and let the blood flow. There is another feature about this. Just as soon as the patient would be in pain in pleuro-pneumonia and would make a noise with every breath, I would take out my lance, and in a little while he would say, "Oh, how much better I feel; how good I feel! That is the beginning of a new life." There are cases now that come up in which it is just as necessary to use the lance as ever before. I have bowed to sentiment many times when afterward I was sorry for it. I am willing to take up the new systems and plans, but I am not willing to use strychnia as the best stimulant. I do not believe that it is the best stimulant in these cases of pneumonia, and as to opium, its use to any great extent is dangerous.

Dr. SNYDER: The paper was full of wholesome truths and practical ideas. Any man who proposes to keep up with the progress of time would not for a moment think of depleting his patient at the

present time. We have enumerated the remedies that support the patient; if we do not understand the action of those drugs, then as men dealing with life it is our duty to study up the action of them. The lancet may have served its purpose, but those days are past. I feel that I have been benefited and strengthened, and I think every one of us has been benefited.

Dr. T. H. STUCKY, Louisville: It is with a feeling of hesitation that I arise to discuss these admirable papers after the addresses of my distinguished predecessors. In the first place, Dr. Wilson's paper in dealing with the abortive treatment of pneumonia by the use of ergotin and the salicylate of soda gave to us the doctrine instilled into me as a student twenty years ago. I have either used these drugs wrong or they do not act as we believe they do. I can not see how ergotin by its action upon the vessel wall is going to exercise a sufficient local influence, notwithstanding its constringing influence, notwithstanding its contractile power, to relieve a hyperemia which may not only be active but decidedly passive in character. I can readily see how the salicylate of soda may be a defibrinizer and an antipyretic, and may exercise an antiseptic influence; but in the management of pneumonia I believe the doctrine laid down by our forefathers has been amplified very materially by elimination. They say they do nothing but deplete, but we can deplete equally as well through the skin, diaphoresis, or through the kidney, or, better still, through the alimentary tract. I believe in every case in which there has been an interference with oxygenation we find an interference with oxidation. There is hepatic torpor. There must be an unloading of the liver. Carbonate of ammonia I would eliminate from my armamentarium of drugs to be used in pneumonia. We have all experienced often enough the irritating influence it has on the stomach. We have all had the nausea and gagging, and why should we throw out the chief entrance of support to the animal economy? Of cold I most heartily approve, exercising as it does the constringing influence ergot has, if it has, and besides being a decided sedative and great ameliorator of pain. Stimulation should be had from the start, without waiting until the heart is weak; keep the heart supported so that it will not become weak. Oxygen is of the greatest value, relieving pain, supporting the heart, increasing the distension and chest expansion, and giving the patient the greatest comfort.

One word regarding Dr. Cecil's paper. I am in most hearty accord with every thing he said. I believe sex, nationality, nativity, environment, and occupation each has an influence, so that every

case of pneumonia stands out as a distinct case, for which we can not prescribe a prescribed treatment.

Dr. W. W. Richmond, Clinton: I wish to say a word in reference to salicylate of soda and ergot. Twenty years ago I was in the habit of using ergot in those cases in which I believed the disease could be modified; but I must say that I have never yet in a case in which I believed the symptoms could be modified found any thing which answered the purpose so well in my hands as veratrum viride. I have seen a number of cases in which the carbonate of ammonium was used. To go back to the old plan of dividing the cases into sthenic and asthenic, I believe there are many cases of pneumonia which, if let alone, will get well without treatment; and again there are many cases which, if not treated properly, will die. I do not mean to say, gentlemen, that we cure all these cases; but we do pursue a plan and course of treatment by which the symptoms are so modified that we do assist nature to a favorable termination. I do not know any method by which we so aid these patients as by the early administration of veratrum viride; that is, in the first twenty four to thirty six hours; after the lapse of that time we have no use for it. In many cases where the pulse is strong and the heart active, while we may relieve the patient with opiates, we are more sure of relieving the condition without harm to the patient with veratrum viride; it is the least harmful of arterial sedatives. I regard it as more harmless than aconite or digitalis, and I have learned in twenty-five years' experience not to place too much confidence in the last named remedy. I believe the nitrate of strychnia, if used early, is more reliable; in fact, I believe it stands at the head of heart stimulants. I have always been a little skeptical about digitalis, but when using strychnia I feel I have a remedy that will not deceive me. I do not consider veratrum viride as so dangerous a drug as the other heart sedatives. When we give a drug in these cases we want something that will act quickly and certainly.

Dr. Frank C. Wilson, Louisville: I have only one word to say, that is in reference to the action of ergot. Ergot I think undoubtedly has a sort of selective action, selecting those arterial vessels that are apt to be in a state of vasomotor paralysis. When you administer ergot its first action is upon any portion of the circulation that is in a congested condition, and acting upon that I have seen the effect of it most markedly illustrated in the results obtained in these cases. I could recite case after case from my own personal experience, but of course I would not care to encumber the paper with such details.

THE UTILITY OF THE BLOOD-CLOT IN THE TREATMENT OF WOUNDS.

By R. C. McChord, M. D.
Lebanon, Ky.

The utility of the blood-clot in the treatment of lacerated wounds has always been recognized by surgeons, and a blood-dressing, before the advent of antiseptic surgery, was considered the best; and the surgeon learned by experience that wounds under this dressing gave less trouble, and, if left undisturbed for a sufficient length of time, frequently healed without suppuration. This was one of the first things to open the eyes of surgeons to the fact, and to demonstrate to them, that suppuration was not necessary to the healing process. On the advent of antiseptic surgery, chemical sterilization, combined with exsiccation, when extensive injuries or operative wounds necessitated a great amount of oozing, was considered an ideal dressing. For this purpose absorbent dressings were used, which had been rendered antiseptic or aseptic by saturation with a chemical germicide, or sterilization, thus preventing decomposition of the absorbed serum or blood, hastening exsiccation, and insuring the protective action of the dressing; but when extensive loss of substance, consequent upon injury or operative wounds, precluded approximation of the walls of the wounds, and rendered healing by first intention impossible, suppuration, with its evil consequences, was almost inevitable until Schede demonstrated a modification of the above dressing, favoring the organization of the moist blood-clot, which rendered it possible to fill up the defects, and by preserving it from exsiccation and putrefaction the wound heals without suppuration, granulations consuming the blood-clot, and

by the time the clot disappears cicatrization is completed and the integrity of the part maintained. To apply this method successfully, it is necessary that we have an antiseptic or aseptic wound, and a well-formed blood-clot, immediately over which and projecting slightly beyond its edge is laid a suitably trimmed piece of fine rubber tissue, previously well soaked in an antiseptic fluid. This is covered with a layer of iodoform, antiseptic or sterile dry gauze, and the whole is well enveloped in an ample covering of dry sublimate or sterile gauze. The film of rubber tissue will preserve the underlying clot in a moist condition, and the outer dressings will absorb and render innocuous the surplus of blood and serum. Possibly from force of habit I prefer for the first iodoform, and for the more ample covering dry sublimate gauze.

This dressing may be allowed to remain on until cicatrization is completed, or, if the outer dressing should have become hard and stiff from the dried blood or serum, it, or even the whole, may be removed and replaced under strict antiseptic precautions; but it is best to leave the wound undisturbed as far as possible.

The utility of this method of the moist blood-clot dressing has been more prominently brought to the attention of the profession in its application to the treatment of distinctive wounds in bones, by which their integral parts are preserved, independent of the presence or absence of a sufficient covering of deep soft parts or skin. The blood-clot being made to fill up the defective space made by operation or injury in the bone, the tissue takes the place of the skin.

That this principle in the treatment of wounds is susceptible of larger application than has been heretofore in vogue I have been convinced for some time, and, acting upon this belief, I have for several years applied it successfully to the treatment of lacerated wounds of the soft parts, with destructive loss of tissue, on various parts of the body; but it is more especially that I desire to call your attention in this short paper to its application in the treatment of wounds of the ends of the fingers, where the

soft parts have been severed or pulled loose from the bone, leaving it exposed without any soft tissue as a cover. We are all aware that such wounds of the phalanges were formerly doomed to amputation; but in these wounds, when the exposed end of the bone was not over one-fourth inch, I have succeeded, by milking the blood from the finger, in forming a clot over the bone, and by the use of this moist blood-clot dressing obtained excellent results and the preservation of the finger in its entirety.

We all know what the loss of the tip end of an index finger or thumb means. These results have been very gratifying to me, and it is astonishing with what rapidity the blood-clot is transformed into new living tissue, a week or ten days being sufficient to effect the transformation. To obtain a properly shaped clot, it has been my habit, as the blood flows, to blow upon it, from a powder blower, iodoform, which favors the formation of the clot and stops the flow of blood at such points as is necessary, the minute film of iodoform helping to preserve the clot while the rubber tissue is being applied.

Should the exposed bone be over one-fourth inch, I do not believe it possible to form a perfect clot over it. In these cases it has been my custom, instead of dissecting back the soft parts sufficiently to get a covering, and then cutting off the bone, I have, in order to save as much of the finger as possible, cut the bone back to a sufficient point, and then formed the blood-clot over it as described above. In the soft parts where the tissues have been scraped out by machinery, the surgeon's knife, or otherwise, it is a very simple process to fill the defect with a blood-clot up even with the skin, and by the use of the moist blood-clot dressing have it to heal in one-half the time and with much less trouble than with ordinary granulations.

HERNIA AND ITS OPERATIVE TREATMENT.

By J. L. Johnson, M. D.
Louisville, Ky.

It shall not be my purpose to enter into details as regards the different varieties of hernia, but simply to speak of the most prevalent forms of this, one of the most common of all human ailments.

"The term hernia is employed to designate the protrusion of any viscus from the cavity in which, under normal conditions, it is contained."

In speaking of hernia, however, it is generally understood to mean inguinal, either oblique or direct. It is, therefore, principally to this form I sball confine my remarks.

The scope of this paper will not permit me to enter into the etiology, pathology or anatomy of hernia, except in so far that I may make myself understood.

Hernia is both congenital and acquired, and as long as it remains reducible there is comparatively little or no danger to life; but it may become strangulated at any time and without premonitory symptoms. Upon coughing or contraction of the abdominal muscles, and when the patient is in the erect position, the hernia presents itself at one of the hernial orifices in the form of a soft tumor or swelling.

Hernia, if acquired, may come on suddenly or gradually.

At times an accurate diagnosis as regards the hernial contents is very difficult, but this is a matter of minor importance, both in reducible and strangulated hernia, as the treatment should be the same. In all cases of hernia the sensation of weakness of the hernial region and dragging of the parts becomes more and more apparent to the patient, attended in many cases by functional disturbances of the bowels.

"Men who suffer from herniæ are not eligible to the army, navy, fire, or police service, and are only accepted as good risks by insurance companies when the rupture is of moderate size, reducible and well supported by a truss."

I believe it is the duty of the surgeon to advise operation for the radical cure of hernia in every case, between the ages of six and fifty years, when the general health of the patient is otherwise good.

It is immaterial as to the location and contents of the hernial sac; a radical operation should be performed at the surgeon's earliest opportunity. Experience has long since proven that palliative treatment of hernia is in the vast majority of cases only adding fuel to the already increasing flame.

I shall casually refer to the palliative or mechanical treatment the more forcibly to demonstrate its non-curative properties. This line of treatment should be resorted to only when more radical means are refused by the patient. While in some instances it may effect a cure in children with very small herniæ of recent formation, its utility is doubtful and should be well considered before subjecting the patient to the tortures of an ill-fitting truss, the ball of which invariably chafes the skin, keeping the parts continually irritated, and in many instances producing such pressure on the spermatic cord and pampiniform plexus of veins that a varicocele is produced and the hernia unsupported. Aside from this, if the truss fits so tightly as to control the hernia, the pressure of the ball diminishes the nutrition of the abdominal muscles around the abdominal ring to such a degree that they become very much thinned, and in this manner causes an increase in the size of the hernial ring, leaving the patient in a worse condition than prior to the application of the truss.

Taking these objections into consideration, I believe the rare cases curable by the use of the truss should be no barrier to the radical operation in all cases where the physical condition and age of the patient will permit.

The necessary and oft-repeated application, removal of and cleansing of the truss is enough to condemn it.

Frequently patients have come to me who for an indefinite length of time have worn a closely fitting truss over an irreducible hernia. It must be apparent to the most casual observer that the truss could not, under such circumstances, prove beneficial; but its continual pressure unquestionably does a vast amount of harm by maintaining a congested and engorged condition of the hernial contents, thus increasing the strength of the already existing adhesions and rendering reduction an utter impossibility without an open operation. I shall briefly refer to the injection plan of treatment, that I may prove its utter inutility. At the time of injection there is some danger of infecting the patient, and the inflammation of the tissues produced by the fluid injected rapidly subsiding leaves the hernial canal more patent than before the beginning of the treatment.

This has been thoroughly demonstrated by W. T. Bull, of New York City. Having operated upon forty consecutive cases by this plan, relieving temporarily all of them, he witnessed the return of the hernia in every case operated upon.

This technique I have only mentioned in order that its worthlessness might be made apparent and justly condemned.

This brings us to another and to me a more important phase of this subject, Herniotomy.

"The history of operative procedures for the radical cure of hernia began with Celsus in the first century, and may properly be divided into ancient, medieval, and modern."

Ancient methods began with Celsus in the first century and ended with the dawn of the tenth.

Medieval began with the tenth and ended with the close of the middle ages, at which time all surgical operations were discontinued.

Modern methods began with the discovery of subcutaneous surgery, this having undergone numerous modifications until the present time. It will perhaps be of some interest to refer to the

work done by Celsus and his contemporaries. "It is to him we are indebted for the origin of operations upon non-strangulated hernia. He would not operate upon strangulated hernia, and was very conservative in his selection of cases for any hernial operation, operating only upon children between six and fourteen years of age, in otherwise perfect physical health, and when the rupture was small.

"Many of his rules could scarcely be improved upon to-day. He advised against operation in umbilical hernia in children. His technique was a free incision and exposition of the sac just as we do to-day." Whether he removed the sac is not known, but we believe he did.

"Before the time of Celsus several methods were employed for the cure of umbilical hernia, the principal one being to ligate the sac high up after reduction of its contents. Celsus improved upon this by ligating the sac and cauterizing the stump.

"Oribassius in the fourth century devised some ingenious methods of operation, a number of which are in use at the present day, and are regarded as original.

"Paul of Ægina operated in the seventh century very much in the same manner as did Celsus, with the important modification of castration, this remaining one of the steps of herniotomy until all operative procedures for the radical cure of hernia were discarded.

"The middle ages mark the introduction of a large number of variations in the technique of the older operations, the chief of which are the following: Castration, exposure, opening of and ligation of the hernial sac, invagination of the sac and scrotum, and cauterization. In the tenth century the attention of the profession was first directed toward the mechanical treatment of hernia, and, with the gradual improvement of the appliances, operations were again abandoned, and rarely, if ever, spoken of by the regular practitioners.

"Step by step we have now arrived at the period marking modern methods of operating. This was first advocated by

Stromeyer in 1831, when he introduced subcutaneous surgery," consisting of the injection plan of treatment to which I have previously referred.

"Gerdy's and Würtzer's operations may be called the first of the modern operations, the principal of which consisted of invagination of the scrotum within the hernial canal and its permanent fixation there.

"Wood's technique was a combination of both the subcutaneous and open operations, and was extensively employed until the more perfected methods devised soon after the advent of Sir Joseph Lister's aseptic method of wound treatment came so forcibly and prominently before surgeons throughout the civilized world. With the introduction of antiseptic surgery there was a distinct return to ancient methods of operating.

"Lister and Steel taking the lead in this movement were soon followed by the German surgeons," and from here the contagion of radical cure spread with incredible rapidity until to-day there is not an up-to-date surgeon upon the globe who is not quite familiar with the techniques of Bassini, Macewen, and Halstead.

"In 1876 Czerny published a series of cases upon which he had operated by obliterating the hernial sac and closing the canal with catgut sutures.

"The principles upon which modern herniotomy is based are obliteration of the sac and canal and transplantation of the cord.

"Leisrink and Segon have shown by a report of five thousand cases that the mortality from operation as long ago as 1886 was only one and a half per cent.

"Bull and Coley, of the Ruptured and Crippled Hospital, New York, have demonstrated that from two hundred and fifty operations performed by them from December, 1891, to March, 1895, in children under fourteen years of age, the mortality was only three deaths, or one and two-tenths per cent, and four relapses. Broca's statistics show that from four hundred and

seventy-seven operations, only two were fatal, and from two hundred and fifty cases traced, there were only three relapses.

"Broca's technique was high ligation of the sac and obliteration of the canal without transplatation of the cord."

The principal dangers of herniotomy are sepsis and hemorrhage from the loosely ligated sections of the omentum. From sixty to ninety per cent of patients remain cured, and should the hernia return, it is more easily controlled than before operation.

The best results follow operation performed in childhood and youth. Extreme age, except under very urgent circumstances, contra-indicates the operation, the ages from four to fifty being most propitious for this special line of work.

"All methods involving the principle that cicatricial tissue forms a barrier preventing return of the hernia have been wisely abandoned, as the principle is false in theory and no longer justifiable in practice." When the cicatrix yields, it does so very rapidly, and the parts become so thinned that no form of support can be worn with comfort.

Primary union in herniotomy, as well as in all other operations, must be regarded as of first importance, therefore any thing interfering with this must be discarded. Any attempt of the surgeon to close the canal by plugging it with omentum, muscular tissue, or invagination of the sac is unsurgical and fraught with certain failure.

The suture material to be used in this work is of very special importance, and demands the closest scrutiny of the surgeon. The failure of many former operations was perhaps due to too early absorption of sutures employed, before union had taken place. The tissues here being principally of a fibrous nature, naturally require longer for healing than those with a more abundant blood-supply.

I shall not enter into a description of the various materials employed for these sutures, but speak briefly of those preferred in surgical work of the present time. Kangaroo tendon, introduced by Marcy, as yet wields the palm of efficiency. When

properly prepared it is said to remain unabsorbed in the tissues from two to three months, and has proven, as previously remarked, to surpass all other suture material for this special line of work, although chromicised catgut is an admirable substitute.

Silk, silkworm gut, and silver wire are not to be considered for obvious reasons, with which you are no doubt quite familiar.

To the present time herniotomy, according to Bassini's technique, has given by far the most satisfactory results. It has withstood the test of eleven years by its originator and for eight years by the profession at large.

Bull and Coley have operated upon some eight hundred cases by Bassini's method with a mortality of one per cent and two per cent of relapses.

Halstead's method, in its essential features, closely resembles Bassini's, the chief difference being ligation of most of the pampiniform plexus of veins and transplantation of the cord outside the external oblique muscle, instead of internal to it, as in Bassini's operation.

This modification does not possess any advantages over Bassini's technique, and is not to be preferred only in perhaps very exceptional cases.

Macewen claims two very important advantages for his operation, which he demonstrated very satisfactorily to me while in attendance upon his clinics in Glasgow, Scotland. The points to which I refer are as follows: He does not ligate the sac, but quilts it up, beginning at the distal end (having first opened it) and continuing up to the internal abdominal ring, when the needle is passed through the internal ring and out through the abdominal muscles, drawing the puckered sac well up inside the internal abdominal ring. A stitch is then taken in the external oblique muscle and the sac snugly anchored in its new position, completely plugging the hernial outlet; again, he does not incise the fibers of the external oblique muscle, thus maintaining the original strength of the belly wall, but with a blunt needle sews

the conjoined tendon to Poupart's ligament with from two to three mattrass sutures, the cord being held aside with the finger or a strip of gauze, just as in Bassini's operation, until its new bed is prepared. Dr. Macewen informed me personally he had published literature upon his operation, in 1876, and was quite sure Bassini had infringed upon his technique and claimed the operation, which has become so popular, as his own.

In all cases of strangulated hernia, observed early or late, a radical operation is demanded, and the earlier the better, before much taxis or manipulation has been practiced for its reduction.

If under anesthesia a hernia can not be reduced in a very few minutes, taxis should be discontinued and the patient quickly prepared for operation. If the case is a severe one and the symptoms of a grave character, of more than twelve hours' duration, taxis should not be employed, as by so doing the gut may be ruptured, causing an extravasation of feces into the peritoneal cavity, after which general peritonitis and death supervene. The gut may be so completely constricted from the beginning that gangrene will be present at the end of a few hours, consequently the necessity of exercising great care when employing taxis. During the process of operation, if the intestine is found to be gangrenous and resection is necessary, it may be done with comparative ease and safety according to my own technique, with which I hope you are quite familiar.

After the reduction of a strangulated hernia the operation for radical cure should proceed as in ordinary cases, the strangulation proving no disadvantage so far as the cure is concerned. If the omentum contained in a hernial sac is small in amount and is perfectly healthy, it is simply returned to the peritoneal cavity. If present in large quantities, it should be drawn down and ligated in sections, care being exercised not to tie too close to the bowel.

All that portion to the distal side of the ligature is cut away and the stump returned to the peritoneal cavity.

The salient points of Macewen's and Halstead's operations having been presented, begging your indulgence for personal allusion, I shall in the briefest manner possible give Bassini's technique of herniotomy, as described in my Pocket Manual on the Technique of Operative Surgery:

First: Make an incision from the spine of the pubis, one inch to the inner side of and parallel to Poupart's ligament, from four to six inches in length, through the skin and superficial fascia to the aponeurosis of the external oblique muscle, and with the fingers bluntly dissect the skin and fascia back, exposing the external oblique muscle and external abdominal ring.

Second: Pass a grooved director through the external abdominal ring, just beneath the aponeurosis of the external oblique muscle, and split it up for three inches, exposing the cord, sac, and edges of the internal oblique and transversalis muscles, which unite and form the conjoined tendon. The arching fibers of the muscles pass over the cord and form the deep ring.

Third: Dissect the aponeurosis of the external oblique freely loose with the fingers from the internal oblique muscle. Have the assistant retract the edges of the wound well, including the aponeurosis of the external oblique. Pass the finger beneath the cord and sac, and separate them *en masse* freely loose from the canal.

Fourth: Dissect the sac loose from the cord, beginning at the upper end. This dissection is very much facilitated by holding the parts between the operator and the light, thus enabling the surgeon to separate the sac from the cord to a much better advantage. When the fingers are worked between the sac and the cord, the remainder of the separation is comparatively easy. I have repeatedly been compelled to open the sac before I could separate it from the cord, so obscure was their union.

Fifth: The conjoined tendon is bluntly dissected loose with the fingers from the peritoneum and surrounding parts, so that its edge will lap freely over Poupart's ligament. This relieves the tension.

Sixth: The sac must be opened in all cases. If it contains omentum, it is ligated in sections high up and cut off. If it contains the bowel, it must be returned to the abdominal cavity and the sac ligated very high up, over the end of the finger in the sac, to prevent tying off a knuckle of the gut. The sac is cut off to the distal side of the ligature and dropped back. The purse-string suture is employed by Gerster, of New York City. It is carried completely around the upper end of the sac, tied and cut off over the end of the finger. The sac is then cut off to the distal side of the ligature and dropped back. This prevents sloughing, as portions of the sac are not included in the ligature.

Seventh: After having trimmed off the fat from the edges of the conjoined tendon, a strip of sterile gauze is passed beneath the cord, which is held aside by an assistant. Sutures of either kangaroo tendon or chromicised catgut, five or six in number, are introduced from within outward, before any of them are tied. A curved needle armed with the suture is passed three fourths of an inch from the edge of and through the conjoined tendon, from above downward. Then, guarding the femoral vessels with the finger of the left hand, the needle is passed through the deep tense portion of Poupart's ligament. The sutures should only be one fourth of an inch apart, and should be tied only tight enough to coaptate the parts perfectly. Great care is taken not to constrict the cord at its upper end.

Eighth: Place upon this newly formed rear wall the cord, and over it sew, with continuous catgut suture, the aponeurosis of the external oblique, taking care not to constrict the cord at the lower end.

Ninth: The skin is closed with continuous or interrupted sutures, as the surgeon prefers, the scar painted over with iodoform collodion and dressed with a dry, sterile dressing of gauze, cotton, and bandage. Apply tightly and allow the dressing to remain ten days, unless complications arise demanding its removal. The patient should remain in bed four weeks, and should be ordered to support the scar with the hand when cough-

ing or straining from any cause. Bassini, the originator of this operation, uses silk sutures throughout his work.

DISCUSSION.

Dr. W. C. Dugan, Louisville: There are several points I wish to refer to. First, in reference to the use of the truss in children. The essayist admitted that sometimes you get good results with the truss in children, and I wish to take exception to that and say that if you advise the truss in children you will, as a rule, get good results. If you use a bandage and do not try to force the hernia back, you will get good results as a rule. In regard to pressure on the cord causing varicocele, such has not been my experience. I think such a result could occur only from the abuse of the truss and not from the use of it, because if you have a truss applied so low down as to press on the cord as it goes over the symphysis pubis, any bad result will be due to the faulty application of the truss, and not to its use. The truss should be applied, not over the symphysis, but over the internal ring where the hernia comes out. I admit that if you apply the truss with such force, and if the truss be of conical shape, you may have absorption of the tissue and again have bad results. But the truss should not be of that shape. It should be broad and with a spring of not sufficient force to give the patient pain. Of course to go into the operation of hernia and bring it up, as the doctor has done, requires time, as has been demonstrated. He has covered the subject thoroughly. He spoke of the Halstead operation being in its essential features the same as the Bassini. Again I wish to differ from the doctor. In the essential features the Halstead operation differs most widely from the Bassini. The Bassini operation simply restores the anatomical parts. If you will study the anatomy and then read up the Bassini operation, any one can appreciate the strong points in the operation: Making your incision and opening up the fibers of the external oblique, exposing the cord, as the gentleman has stated, separating it from the internal ring down, lifting it up, passing your finger around and separating it from the internal structures, which is the most essential point, as claimed by McBurney and all operators of modern times, and then tying the cord very high up. Then there is one point that I think the doctor did not make strong enough. The sac should not be opened until you separate it, if possible. Then, after reducing the hernia, take the body of the sac up in the hand and pass

the finger down into the cavity, so that the assistant can tie over the finger. This should be done for two purposes: First, you can not include part of the omentum or a knuckle of the intestine, which has been done a number of times by competent operators when they neglected to tie off the sac high up and tie over the finger. This is a very important point, and one I wish to emphasize, to introduce the finger to be sure you do not include part of the viscera. And, secondly, it should be done in order that you may be able to place the ligature well down on the peritoneum, and thus do away with the infundibulum that nature has left.

Dr. J. D. MADDOX, Rockport: Just one word in regard to strangulated hernia and a manipulation which I do not remember seeing or hearing mentioned, and which, if it had been mentioned, was found on my part accidentally. It is a manipulation from the outside. Trying to reduce a hernia with the hips elevated, and failing to do it, I reached above the tumor (or rather below, in the position occupied by the patient), and accidentally catching hold of the intestine I succeeded in pulling it out from below. That is, instead of pushing it out, as we ordinarily do, I pulled it out with simple traction.

Dr. J. L. JOHNSON (in closing): In reference to opening the sac, I said that I had been compelled in many instances to open the sac before separating it. I think it is advisable first to separate the sac, but sometimes that is impossible. The gentleman stated that I said that the essential features of the Halstead operation and Bassini's operation were the same. I think I did not say that, but I said, having mentioned the essential features of Bassini's operation, I would pass on to Halstead's.

TRIPLETS: REPORT OF A CASE.

By J. Louis Early, B. S., M. D.
Knoxville, Ky.

On February 5, 1898, I was called to see Mrs. H. P., a multipara, forty years of age.

Her suffering was so great that both she and her husband were greatly frightened. Upon investigation I found that she was pregnant and would be a mother again some time in March following. The suffering was due to the great distortion of her body and a very troublesome diarrhea. I gave her bismuth subnit. in ten-grain and pow. opium in one-grain doses, a dose every three hours, and relieved both the pain and diarrhea.

The history of the case from that time on to confinement was a very unusual one. As she neared the time for labor she was attacked with insomnia. She ate very little, and very often would not retain the food in her stomach much longer than she was eating it, and was so racked with pain night and day as to distort her features and keep her in bed the greater part of the time. At times when her sufferings were most intense she was relieved by sulph. morphia in half-grain doses, but, knowing the disastrous results from the indiscriminate use of the drug, she was not allowed free access to it.

On March 30th I was hurriedly called to see her, and found her suffering very greatly, apparently with sciatica of the right leg, but she was really in labor, and inside of two hours I delivered her of three well-developed children, two girls and one boy, weighing five pounds each. The mother, contrary to my expectations, was not very greatly prostrated by weakness, but stood the labor as well as the average woman with only one child.

Now the particular part of the labor I want to call especial attention to was the delivery of the placentæ. There was one large double and one single placenta. A girl was born first, and in about six minutes the boy was born, and five minutes later the other girl was born. The first two presented by left occipito-frontalis, and the last by the breech. The last girl was born partis asphyxis, and it was with the greatest difficulty that I could resuscitate her. Were both girls in the double placenta and the boy in the single, or was the first girl with the boy in the double and the last girl in the single placenta? I would like to hear a discussion of this by some of the eminent authorities present.

The lady had previously given birth to eight children, but only one at a time. She was of small stature, only weighing one hundred and ten pounds. Her health had had no material change in the past five years, and after this labor she was soon as strong and healthy as she could want to be.

The children all lived and did well up to the sixth month, when from improper artificial feeding and the extreme hot weather the two girls died. The boy is still living, and is a good healthy youngster.

SOME CASES IN COUNTRY SURGERY.

By Chas. W. Aitkin, M. D.
Flemingsburg, Ky.

While surgical cases in the country do not differ from such cases in the cities, yet I am led to use this title for a brief report of cases that have come under my observation as a country practitioner during the past few months. The expectant plan of treatment in surgical cases is gradually giving way to the more advanced practice of doing surgery when it is deemed advisable; the progress, however, is slow.

Our section of Kentucky has suffered from the fact that some of the best surgeons in our State as well as in adjoining States have had fatal terminations in most of the cases that have been referred to them for operative work; so that the laity now invariably refer to these facts when an operation is advised; and it is with much difficulty that a consent is obtained to do or to have done any thing of sufficient importance to be dignified as an operation. It is a source of regret that these objections raised by the laity are to a considerable extent encouraged by so-called conservative physicians.

It has been my painful experience to see many fatal terminations in cases of sickness where a recovery to health might have resulted from early judicious operative work. During the past few months, of the cases I have operated upon I deem the following for some reason or reasons as worthy of report:

Case 1. Miss M., aged eighteen years, was taken suddenly ill Thursday night with severe colicky pains; salts were administered, and good purgative action resulted on the following two days; she also had more or less continuous vomiting. I saw this patient first on Saturday evening, forty eight hours after the initiatory

symptoms; she was still suffering severe pain in the abdomen, marked tenderness in vermiform appendicular region, quick pulse, temperature 103° F. I advised appendicotomy. The patient being a visitor in our county, she desired to communicate with her relatives at home, so the operation was postponed until early Monday morning, eighty-four hours after the first symptoms of the attack.

At that time her condition was as follows: Nausea and vomiting; general abdominal tenderness, though more marked over the appendix; pulse 152; temperature 102.2° F.; respiration 38; abdomen tense. Upon opening the abdomen the appendix was found to be gangrenous, and for at least one and a half inches from its cecal attachment it was free in the abdominal cavity, but from that point to its free end it was bound down and fairly well walled off from the free peritoneal cavity by light adhesions. The peritoneal cavity was well protected with gauze sponges; the appendix was carefully freed from its mesentery and adhesions; a silk ligature was placed at the most healthy-looking part near the gut and the division made; the stump was thoroughly cleansed, and carbolic acid was applied.

The exciting cause of the attack was found to be three good-sized pieces of a chestnut kernel. The wound was dried thoroughly with gauze sponges, and the cavity was protected by packing around the stump with iodoform gauze. This packing was left in position for twenty-four hours, when it was removed, and the free cavity was well walled off except at the lowest point. After leaving another packing for twenty-four hours, the walling off was perfected; from that time the dressing consisted in washing the wound once daily with hot sterile water, and in packing it lightly with gauze for protection and drainage purposes.

On the third day after the operation the patient developed pyemic symptoms, which became alarming after twenty-four hours; a search was made for the pus, and it was found walled off by easily broken up adhesions fully one and a half inches

above the upper point of incision; this cavity was cleaned out, thoroughly irrigated, and lightly packed with gauze. The whole wound was continuously dressed in this way until it healed. The patient made a good recovery.

The points interesting to me in this case were the gangrenous condition of the appendix, a part of which was still free in the abdominal cavity, and the pyemic condition which followed in a few days.

The next case to which I desire to refer is as follows:

CASE 2. Mrs. F., aged thirty six years; gave history of gall-stone colic for four years; she had found gall-stones in the alimentary evacuations; after these attacks at several distinct times, under protracted medical treatment, the patient seemed to improve, and for a period of a year she had not suffered pain. I saw the patient some months before an operation was agreed to, and in consultation a diagnosis of malignant disease of pylorus and duodenum as well as gall-stones was made. An exploratory operation was advised; this was not agreed to for three or four months; by this time, however, the gall-bladder had become so distended that the patient asked for any thing for relief. A laparotomy was done; the gall-bladder was found enormously distended, and over sixteen ounces of biliary material was removed, but not a gall-stone was found in the bladder or ducts. The obstruction was due to the malignant growth which had been previously diagnosed. The abdomen was closed with silkworm gut; primary union took place, and the patient was up after two weeks, though only to look forward to suffering and death from cancer. She lived a few months, and died of starvation. The emptying of the gall-bladder, however, gave her considerable relief.

We expected to find the malignant condition which was present, and were about as fully confident of finding gall-stones, which were not present. Fortunately an unfavorable prognosis was given before the operation.

The third case I desire to report was referred to me by my friend, Dr. Winter, of Hillsboro, Ky.:

CASE 3. Mr. P., aged eighteen years; suffered from earache accompanied by a purulent discharge from the left ear for two months; two weeks before I saw him—December 27, 1898—he began to develop septic symptoms, and for the week following his first visit to my office he had an average daily temperature of 102° F., persistent headache, a continual fetid discharge from the ear, locomotion so impaired that he was compelled to keep quiet, and a general tenderness around the ear, more especially over the mastoid cells. He consented to an operation. The incision was made, as usual, over the mastoid, the periosteum dissected out of the way, and the bone was chiseled carefully down to the cells; a very small quantity of pus escaped from two sinuses, which were united by chiseling a groove from one to the other; the inner surface to the outer plate was rough, and small particles of bone were easily loosened; these particles were removed, the cavity washed with a 1 to 500 bichloride solution, lightly packed with gauze, and dressed in the usual way.

The after-treatment consisted of keeping the wound well cleansed with a 1 to 2000 bichloride solution and lightly packing with gauze each day. The patient's septic condition cleared up at once, there being no elevation of temperature after twenty-four hours; the pain was relieved, locomotion became perfect, and the general tenderness around the ear was gone. Granular tissue in the ear was curetted and cleansed with bichloride, but a month later I made application of 95 per cent carbolic acid for three or four applications, each a week apart, which gave the desired result of destroying the granular tissue and thus arresting the aural discharge. Fortunately the hearing is not impaired to any appreciable degree.

The last case which I shall report shows the dangers of delay, and also why we have trouble in getting the consent of patients for operative work at the proper time.

CASE 4. Mr. L., aged thirty-nine years. I saw him in consultation; the case was a strangulated indirect inguinal hernia; taxis had been unsuccessful. There was a disagreement as to operative work in case a reduction could not be made under anesthesia. The patient's mind being biased against an operation, further consultation was had, and, what proved to be unfortunate in the end, a reduction of the mass was accomplished under anesthesia. A truss failed to do successful work, for immediately following a free action from the bowel the same day the hernia again descended into the scrotum. Taxis again failed, even under anesthesia. Forty-eight hours afterward I saw the patient again with several consultants; circulation was 154; respiration 38, and a slight elevation of temperature. By this time the patient asked for an operation. An unfavorable prognosis was given, but an attempt at relief was undertaken.

The tissues were divided down to the sac; from the sac the usual fluid accompanying a strangulated hernia—which in this case was excessive—was removed, and some fecal matter was found free in the sac; the gut had a small opening about one and a half inches below the point of strangulation, and at numerous points the necrosis was so far advanced as to require at least five inches of the gut to be resected. The anesthetist had to give the patient strychnia and nitro-glycerine from the beginning of the anesthesia, and when the gut was divided the shock to the patient was alarming at once; however, the operation was completed as rapidly as possible, but the patient succumbed without gaining consciousness from the anesthesia. This case illustrates what we have to contend with in the country.

So frequently when operative work would promise excellent results we must wait and hear exclamations about the "cruel knife" and the "cutting doctor," and then, as the end is nearing, we are told, "Well, if there is *any chance* at all, go ahead and operate."

Surgery in such cases usually brings the art into disrepute in local communities, and in the majority of cases needing operative

work in the country we find them advanced to that point where there is no other chance for recovery whatever, and that chance is reduced to the minimum by being put off as the very last resort.

The laity is not always at fault, for oftentimes the family physician never loses an opportunity to deplore surgery, and sometimes I fear his deplorations are due to the fact that he does not do such work, and rather than have it done he prefers to trust to medication. Let us as country doctors get rid of old fogy conservatism, *any way* to that degree so that we will do or have done what is best for our patients, and let us *never* depreciate that branch in our profession that does so much to restore health, prolong life, and alleviate suffering.

DISCUSSION.

Dr. J. B. Bullitt, Louisville: I am sure that I voice the feeling of all the other gentlemen present when I congratulate the doctor and deplore, with him, the death of the last patient mentioned. Dr. Aitkin has very aptly put it, for these cases are certainly very often sacrificed by the family and family doctor despite the surgeon. It is difficult to know how to deal with these cases. This is notably true of those cases of appendicitis in which an early operation would be successful; but often these cases do not come at that time, and when the surgeon is called in as a last resort the patient dies, and he is often said to have died as a result of surgery. It is an old story and a question that confronts us to-day. The question arises all the time, What is the proper thing to do under such circumstances? Should the surgeon be willing to shoulder all the opprobrium that comes to him and surgery in case of a fatal issue, or should he refuse to operate in these cases in which surgery is so long deferred? I believe it would often be better for the surgeon to say that the case has progressed so far that an operation is hopeless, and the physician who has recommended waiting should be compelled to shoulder the opprobrium of the fatality, and the public would soon come then to understand that when the patient dies from a late operation the fault is often with the physician, and not with the surgeon.

So long as the surgeon is called in late and operates, he will be blamed in case of death for what is manifestly not his fault. I know a great many surgeons feel a sort of responsibility and moral obligation to operate upon these patients and give them any possible chance. But really it would seem that our duty to humanity, under such circumstances, is frequently to refuse operation, for thus we may eventually do much more for the patients in the future than we can for the patient at the time we are called upon to do an operation that is practically useless.

Dr. W. C. DUGAN, Louisville: I have only one point to make, and that is, I think the doctor should not have gone on and made a resection in the operation, which only made it that much more hopeless. When he found the condition of the patient almost hopeless, he could have left an artificial opening and given the people to understand that he simply opened up the hernial sac. I think that would have been better. In regard to the first case mentioned, of operation for appendicitis, I am exceedingly glad the doctor reported finding those foreign bodies in that case. I have operated now something over one hundred times for appendicitis, and have found a foreign body only one time. Several times I have found enteroliths, and sometimes thought that I found an orange seed or a lemon seed, but on pressing it between the fingers I would find it only an enterolith and not a foreign body. The doctor is certainly to be congratulated upon the technique in that case. The responsibility he assumed was very great indeed; the high pulse and temperature and the vomiting certainly made it look grave. I am exceedingly glad he reported the mastoid cases, for they are so often neglected by the country practitioner, the "country doctor," as he has put it. They can all relieve those cases by simply cutting down and opening the bone with a chisel. Often one stroke of the chisel will relieve the pus. I would take exception to one statement of the doctor, and that is in reference to closing up the wound in gall-bladder cases. I always leave the gall-bladder open for drainage. It seems to me very important to have drainage, and let the wound heal by granulation. If you find a stone down in the common duct, it is recommended that we should not attempt to remove the stone at the time of the operation, but stitch the gall-bladder to the wound and wait for the stone to come back. I confess that I lost one patient by irrigating before the adhesions were sufficiently firm. We should wait several days, until the parts are well united, and then we can irrigate, fill up the ducts, and invite a return of the stone.

Dr. WILLIAM BAILEY: I shall not presume to discuss the surgical matters at all, but I want to say a few things from the standpoint of the general practitioner. I believe that the duty of the physician should be a conscientious one, and as far as possible it should be an intelligent duty. There are certain diseases that I think we all recognize at the present day are largely surgical. To illustrate this, I will ask your attention to the question of diseases involving the appendix. As a general practitioner I am ready and free to say to you that they can not ask me too soon to bring the aid of the surgeon when I recognize appendicitis. I believe that evil comes from delay. The possibilities of recovery are lessened every way. Consequently, when I am called and recognize a case of appendicitis, I select a conscientious surgeon and ask him to see the case, and ask him to determine, as he is better able to do, whether operation is proper. And thus I believe I am doing the best thing possible for my patient. Our duty is determined by following our convictions as to what is best in the individual case. As to the propriety of the surgeon's refusing to operate because it will do surgery an injury, I am not much in sympathy with that suggestion. Here is an opportunity possibly to save the patient's life by surgery, and even though the chances may be only one in a hundred, we should honestly give that patient, even at the expense of the reputation of the physician and surgeon, the one-hundredth chance. [Applause.] Gentlemen, when we are confronted by this question, if we honestly perform our work and conscientiously do our duty, we shall not regret any false impressions that may be created.

Dr. J. F. YAGER: I arise to endorse my old friend, Dr. Bailey. His suggestions were of the best and most liberal character. Dr. Bailey told you the solid truth, that in our duty as general practitioners, and in our work as general practitioners, we should teach the community at large that it is not so much of an operation to open the bowel, to make a little incision and know what is there to a dead certainty, and not go about with an uncertainty, and when the patient dies not know what he died of. I believe it is best to call in the surgeon, as Dr. Bailey said, and throw the responsibility upon him, and not risk ourselves. And as to hurting the science, why, that is nonsense. Quite a number of patients are saved even in bad cases. And what is the value of a life? The operation is so innocent when properly and scientifically done. Let the constitution be pretty fair and every thing be on a level with what we call healthy, and then, if the operation is performed in the proper way, almost every case would probably get well. It has been suggested that we should not run the

risk in bad cases. Why, let us run it, and half the cases will probably get well.

Dr. CHERRY: I want to mention a case to illustrate what often occurs in these cases. In the case of a very fat negress with a long hernia there were symptoms of strangulation. Under anesthesia the hernia seemed to be completely reduced. The ordinary gurgling was heard. Several gentlemen present thought that it was all right. A few days later I was passing by and was called in, and the most fearful odor met my nostrils. I found that the bowels had moved well, and that there was no tenderness and no vomiting, yet there was sloughing of the abdominal wall. It speedily caused the death of the patient. I mention the case to show that not all cases are as simple as we might expect them to be.

Dr. AITKIN (in closing): I agree with Dr. Bullitt in his remarks about the time and whether we should operate in cases. It is our duty to let the family know our opinion in regard to the case, and then propose an operation and give the patient any chances that may be left. Dr. Dugan's criticism in regard to the hernia case I think is a justifiable criticism with reference to the artificial opening. If I had to do the operation again I should take the suggestion offered by Dr. Dugan and make an artificial anus. The reference to the number of operations made without finding foreign bodies calls to my mind that I have found three cases in which there were foreign bodies; two of them were melon seeds, and the third one was that referred to in the paper in which a chestnut hull was found. As to leaving the gall-bladder open for drainage, I think that should be done as a rule, but the obstruction here was so complete from malignant disease that it seemed to the operator and those about him as well for the patient to be dead as alive, and the sooner death came the better, owing to the cancerous condition. If all our practitioners were like Dr. Bailey and these gentlemen who are each year in attendance upon the meeting of the Medical Association, we should have no trouble getting to operate upon these cases. The difficulty comes from the practitioners who stay at home and do not keep abreast of the times.

NEW ARTS IN PRACTICE.

By Wm. B. Doherty, M. D.
Louisville, Ky.

Sepsis, asepsis, and antisepsis, germs and germicides, cures and curers, subjects which embrace almost the whole domain of medical science, will be briefly considered in the limited space of a paper devoted to some of the new arts in practice. Dirt and darkness, in the broadest and most comprehensive signification of the terms, are the chief factors in the causation of disease; and pure water, pure air, pure food, pure soil, and sunshine are the best measures for its prevention and relief. Cleanliness, persistent, yea, eternal cleanliness, is next to godliness, and is the price of safety. The advantages of asepsis by warm water alone, and antisepsis by the use of chemical agents for the prevention or destruction of pus, have been carefully considered and zealously discussed by their respective advocates. For some time the profession paid homage to the germicidal properties of carbolic acid, but later the great king hydrargyri bichloridum appeared as an annihilator of germs, and has held sway, though it may be possible within the next few years we shall turn back and recognize in the inorganic proximate principles of salt and water the best and safest disinfectants we possess. The germ-hunting theorist who believes that he sees through the microscope myriads of death-dealing bacteria has a very plausible solution of the cause of all the ills that flesh is heir to, and believes that by killing the bacteria the disease is subdued. But alas! the water we drink, the air we breathe, the earth we tread upon, teem with micro-organisms. What good or harm they do is not so well known. Bananas will not grow in Alaska; the products of the sunny south will not mature in the extreme north; nor will the constitution of the

individual who has a good inheritance and proper food, air, and exercise be easily affected by those much-dreaded microbes. It would appear that while so much fascinating investigation and learned research have been devoted to the study of the genus bacillus and its habitat, the genus homo and his environment have not received the same degree of careful thought and scientific solicitude. To render man invulnerable to the ravages of disease, it must be conceded that the great demolishers or devourers of germs, the worthy fortifiers of our constitutions, the great navy of infinitesimal cells, the wandering phagocytes that are continually fighting our battle in the blood, truly the sea of life, must have their armament strengthened by giving the system pure air, good food, and healthful exercise. Vital resistance, which is mainly the product of seed, soil, and surroundings, must be increased rather than lowered by the artificial methods of living which now obtain if the attacks of our great foes, the infinitesimally small and numberless microbes, are to be rendered innocuous. While recuperative or curative treatment by such artificial agents as bactericides is almost universally practiced in cases of phthisis, the great plague of the human race, hygienic means are not so rigidly or persistently enforced.

Cure, cure, cure! the piteous appeal of the weary sufferer, has always been the talisman of the vender of nostrums and the trade-mark of the impudent quack. There is possibly no word in the English language whose scientific meaning is so little understood by the laity as the word cure, which, derived from the Latin *cura*, care, means to care for properly. There is no positive cure or specific for any disease, though the efficacy of medicines can not be questioned. The existing condition, the constitution, the weak points of the organism must be attended to, each case being a law unto itself. As the quantity and quality of life are indefinite and unknown, it follows that from uncertain premises certain results can not be obtained, nor can cures be guaranteed. The mystery of life makes its duration always a matter of uncertainty. None may even lay claim to a knowl-

edge of its tenure for a single hour. The pilot can steer the ship, but he can not quell the storm; the agriculturist can sow the seed, but may not reap the harvest; the physician can prolong life, but may not prevent death. While the profession of medicine is of the highest calling in the sphere of mortal life, its dignity and usefulness have been assailed and impaired by the low arts of boasting and cunning, and the wily advertising schemes which now prevail. The late Dr. Oliver Wendell Holmes said that "Quackery hobbles on two crutches, the tattle of women and the certificates of clergymen," to which we may add the testimonials of politicians and their pictures in the papers. Religious journals will advertise and publish statements of "sure cures" from church divines that are calculated to mislead and delude the people. It is unfortunate that clergymen will allow their names to be used for such objectionable purposes. There are quacks within the profession who will write articles, paid for by drug firms, extolling the virtues and curative properties of their medical preparations without even having tested any of them. There are medical journals, established for mercantile purposes, padded with many untruthful advertisements. They contain medical literature as fanciful and untruthful in its expression as the tales of Gulliver's Travels or of the Arabian Nights.

The code of ethics, which has been designated as the doctrine of correct manners, or that of philosophy, which defines the principles of professional conduct, has been vetoed by *ego*, the coat of arms of many physicians engaged in the art of trumpeting their reports of successful cases, while the potent influence of the *vis medicatrix naturæ* is not recognized.

The profession is at present overburdened with false specialism and too many young and inexperienced physicians playing the role of "specialists." The honest specialist who, after years of experience in the general practice of medicine, may have acquired a practical all-around knowledge of disease, has a taste for some special line of work and thought, and prosecutes his studies in that direction, is worthy of all credit and credence.

But man is not made of eyes, ears, muscles, bones, or nerves separately, nor can we recognize him as a machine only. The heart is more than a mechanical pump, the lungs far superior to a bellows. The brain is not an electric power-house, and the human being can not be disconnected and disintegrated by a mechanical device or a "trick of the loop" and distributed to the chief artisans of various workshops. No! There is a beautiful, interdependent, and harmonious action existing between all parts of the human system. The specialist who devotes his attention to the eye can never be a good physician unless he fully understands that the affection of the eye which he treats may be due to a constitutional disease and should be treated accordingly. The appendicitist must not be an exclusivist, an incisor of the bowel, or a worshipper of a detached idea. The family physician is the safest to employ, and should be first consulted in all cases of disease before seeking any specialist. Should he detect a diseased condition that may require more dexterity of manipulation or the skill of a craftsman, he will gladly seek counsel, and the knowledge derived from his experience in treating the family, the inherited weakness of individuals, or the special knowledge of the case, will be necessary to the successful labor of the specialist.

We find in the thirty-eighth chapter of Ecclesiastes the profession of medicine approved by God, and the fourteenth and fifteenth chapters of Leviticus treat of hygiene, so the scientific view of specialism is given in St. Paul's letter to the Corinthians, chapter twelfth, verse twentieth:

"For as a body is one, and hath many members; and all the members of the body, whereas there are many yet there is one body; for the body also is not only one member, but many. If the foot should say, 'because I am not the hand, I am not the body;' is it therefore not of the body? And if the ear should say, 'because I am not the eye, I am not of the body;' is it therefore not of the body? If the whole body were the eye, where would be the hearing? If the whole were hearing, where

would be the smelling? And if they were all one member, where would be the body? And the eye can not say to the hand, 'I need not thy help.' Nor again the head to the feet, 'I have no need of thee.' And if one member suffer any thing, all the members suffer with it."

Man is the dupeable animal. Quacks in medicine, quacks in religion, and quacks in politics know this and act on this knowledge. There is scarcely any one who can not be taken like a trout by lure. There are quacks of all kinds, from the most ignorant to the highest type of intellectuality. The habit doctor, who "cures" the whisky habit, the tobacco habit, the morphine habit, the cocaine habit, is possibly the latest addition to the ranks of quackery. How any person of reason can comprehend why a physician should give medicine for the "cure" of a habit, surpasses all belief. Suppose that I am a victim of the whisky habit, or morphine habit, and present myself to one of those quacks for "cure." I tell him I am in good health, and he, thinking himself able to make an examination of my physical conditions, finds that my heart, liver, lungs, brain, kidneys, nervous system, etc., are healthy. Why, then, should he give me any medicine? He might as well give medicine to prevent the habit of swearing as to give a healthy person medicine for the cure of any habit. Of course when there is an abnormal condition of any organ, or of the nervous system, it becomes necessary to use remedies for relief. This quack boasts of having a secret remedy for the purpose of strengthening the will-power. How can he tell what is involved? Habit means custom, fixed custom, not an entity, and as it may not show any perverted condition of nervous tissue or of any organ, its treatment under those circumstances is the sheerest nonsense. Why not take the chloride of gold or the sulphate of strychnine for the habit of telling falsehoods?

The opium and cocaine habits are alarmingly on the increase. I have made inquiries of druggists in different portions of the city, and from their statements I am led to believe that at least

two thousand, and probably four thousand, people in Louisville are habitues of opium and cocaine. It may be presumed that the same ratio to the population exists in other cities and towns, but probably not so great in rural districts. How often is the pleasing physician to blame for encouraging this enthralling, crushing, and blighting habit by the unnecessary use of morphine given by the mouth or hypodermatically, simply because some patients demand a sleep-producing or pain-relieving medicine, irrespective of any contra-indication to its use that may exist! The accommodating druggist is also deserving of censure in refilling, for an indefinite period, prescriptions containing opium without the consent of the prescriber. The hypodermic syringe is getting to be a dangerous popular household commodity, especially in high-strung and fashionable families. The physician who orders a hypodermic syringe and morphia tablets to be used by the patient is guilty of the act of a dangerous criminal. The unfortunate victim of the opium or cocaine habit seems to be in a more depraved and irretrievable condition than his brother in misery who is a slave to the habit of alcohol.

The habit of self-medication causes far more deaths every year in our country than the carnage inflicted on both sides during our recent war with Spain. Our gambling propensities as a nation are shown in the worst light when we gamble on our lives. The digestive tract appears to be a slot-machine into which its possessor takes pleasure in thrusting any preparation with a euphonious name suggested for the "cure" of disease, in newspapers, in circulars on our door-steps, on posters on the dead walls of cities, in the street-cars, on the fences, along the lines of travel, yea, on the mountain tops, to delude the healthy, or seeker after health, from enjoying the advantages of such a salutary region. A morbid hysterical condition often results in many people from reading and studying flaming and picturesque notices regarding their nerves, livers, hearts, kidneys, etc. Laboring under the delusion of being ill, thousands will unnecessarily take drugs without consulting a physician, try their

luck in "cures" as they would in cards at the faro-table, and become dyspeptics, neurasthenics, and inebriates in consequence. Instead of obtaining the best remedies and advice from those qualified by education and experience to bestow it, people will pour drugs of which they know nothing into a body of which they know less, and will *try* and keep on trying their luck as long as the pleasing advertisements appear, to be changed only when a more alluring picture and catchy testimonial of a "sure cure" presents itself. 4, 11, 14, 44—you pay your money and take your choice—a veritable lottery on life. The great lottery drawings of the world will give a list of the few big prizes that are won, but the names of the thousands and thousands who did not succeed in getting any thing are not intended to be known by the emotional and foolish creatures who invest their money in such gambling schemes. And so it is with patent medicines. The multitude whose constitutions are really injured, or who received no benefit whatever from those nostrums, are never heard of. "Foolery, sir, does walk about the orb, like the sun; it shines everywhere." How fortunate it would be for humanity if the tons of headache powders, the barrels of blood purifiers, and the hogsheads of liver pills were thrown into the sea, rather than into the stomachs of people by men who scarcely know the name of a bone or muscle, or the function of a single organ of the body!

We have many myopic theorists within the profession, who, like limpets attached to the rocks, know nothing of what is going on beyond their own shells or habitations. There are experimental doctors who try every new fad and mechanical appliance and remedy that appears in the journals in order to be recognized as *fin-de-siècle*. This so-called up-to-date doctor is usually the greatest humbug that exists. Something new, but not necessarily true, the people want, and why should he not be the man to give it to them? He may be a "curer" by massage, electricity, or oxygen, the stomach-tube or the X-rays, or what-

ever may be the fashion of the moment. He exaggerates the importance of every new nostrum or mechanical device.

The advantage of hospitals for operative work, surgical rest, and rational medical treatment can not be questioned, but there is some danger "of goodness growing into a pleurisy," resulting in a condition of hospitalism and institutionalism, especially among the neurotic. The enervating influences due to lack of employment, vicious luxury, and indoor life among those not confined to bed in such institutions, tend to lower vitality and may increase degenerative traits and hysterical tendencies. The abuse of massage and electricity, by lessening will-power, may produce a condition of prudishness and morbidity, by magnifying the importance of peccadilloes into grave physical conditions. Our own lamented Dr. Cowling characterized massage as a great remedy for those that are well but will not take exercise, and are not too lazy to lie down and be rubbed.

The pendulum must swing back from the enervating artificialities of modern living to the plain and healthful simplicities of nature, from tentative instrumentation and drugging for the "cure" of disease to rational individual treatment on broad lines, if the invalidism which characterizes the people of our present civilization is to be prevented. The operative part, the instrumental aid, or the dose of medicine is generally attended to, while the habits and habitation of the patient, his food and drink do not usually receive the consideration which their importance as factors in the treatment deserves. Three minutes without air, three days without water, or three weeks without food usually results in death. Air may therefore be considered as the chief thing that the body wants, though it is true that we can not live on air alone, but require food and drink. Yet the danger of air sewage, or rebreathed air as an insidious poison in public places, churches, schools, and stores is not fully recognized by the laity. While municipal legislation in the matter of cleanliness is principally confined to filthy gutters and alleys whose obnoxious odors wound the sensibilities of our olfactories, we have not yet

progressed so far as to include the close and corrupted air of stores and factories as a menace to our health. Probably the most important question in hygiene that confronts the people, especially in the cities of this country, is that of air, sufficiently pure to give more red blood, better digestion, and invigorated muscular and nervous systems. Many of the large department stores and offices, with their artificial modes of heating and ventilation, are nothing more than disease-breeding colonies, owing to their lack of fresh air. Our sky-scraping buildings may present thoughts and ideas of modern progress to the eye of the business man, but to the physician many of them are insidious death-traps. Sunlight and sunlit rooms are at a discount in the house of commerce and trade. Hotels are built so that the modern troglodytes who live there must eat, drink, and sleep, and use the least possible amount of exercise, and inhale as little air as possible. Electric lights that are really dark with excessive brightness burn brightly at noonday in the basements and offices of hotels and business houses, and Holy Light, offering of heaven, firstborn solar light, is excluded. In the summer time the atmosphere of those luxuriously furnished apartments have, owing to their peculiar construction, a close, debilitating, and stuffy atmosphere. In winter a temperature of about 80 degree pervades those buildings internally, while the mercury is many degrees below the freezing point out-of-doors. The unfortunate cave-dweller who lives under such conditions can not continue in the possession of good health for many years. Such an existence does not tend to longevity. The tendency in the present fashionable style of architecture in our cities is unfortunately to minimize space, rooms being made very small, and windows so arranged as to exclude the air to a great extent. How few patients who consult a physician deem the question of pure air of any importance as a remedial agent to strengthen their debilitated constitutions! Many of the wage-earners of our cities, but particularly women employed in stores and offices, are underfed, owing to lack of proper respiration,

the last act in the process of digestion. The shop girl who hurriedly eats a piece of bread and butter and takes a cup of coffee for breakfast, enters the street-car, crowded almost to suffocation by persons going to their different places of employment, and incarcerated afterward for hours in a business dungeon or close workshop without having the privilege perhaps of resting her weary limbs even for a moment, has no appetite for her scanty lunch, and less for her evening meal when she returns home fatigued and exhausted. Lack of fresh air, proper exercise, and sunlight renders her an easy prey, owing to the lessened power of vital resistance, for the germs of consumption to feast upon.

The limited space of this paper will not allow a notice of the importance of water, food, sunlight, and exercise in the treatment of disease.

The physician deems it better to get his patients well with little or no medicine if possible. He will carefully avoid using the word *cure*. While the number of remedial agents given in the books are legion, yet he selects only those that have been tested and found to be trustworthy and reliable. He partakes of the spirit of the artist. The quick eye, the observant gentleness, the sympathizing heart, the seizing of the actual circumstances, the impressionableness to all that is soft and winning, and lovely, and weak, and piteous; these belong to the true physician as well as the true painter. He is an official minister to human sorrow, and recognizes in his professional work the highest type of duty, of man's humanity to man.

DISCUSSION.

Dr. McCormack: It can only be a matter of regret that we can not express and emphasize to our own patients and the social gatherings of our friends exactly the things that have been so excellently presented by the doctor. Every physician must feel the necessity of fair education not only among our poor people, but among our good people. It is to be regretted that the paper can be read only before

an Association like this, composed of members who feel with and for the essayist, and that it can not be impressed upon all the people by such a master of our language as the doctor has shown himself to be.

Dr. L. L. SOLOMON, Louisville: I would beg leave more especially to impress the members of this Society with the fact that a new nuisance has recently made its appearance. I refer to the establishment by the larger pharmaceutical houses of journals, so-called ethical journals with therapeutic notes, etc. These concerns make bold to send a journal to the profession throughout the world gratis, or at its nominal price, say a dollar per annum. These journals advertise the articles of the houses which publish them. The journal may bear not the name nor the address of the house which publishes it, but even a fictitious name of some editor, and gives as an address some small by-street. It is the duty of the busy practitioner to cull out and ascertain what is good when such a condition of affairs prevails. And I would recommend that we put our seal of disapproval upon such journals by returning them and informing such houses that we can not afford such literature.

As to opium, it seems that some make bold to sell opium or morphine, while they refuse the patient alcohol with which to rub himself, without a prescription. In Louisville it is impossible for a patient to get five cents' worth of alcohol, but any child can go into a drug store and purchase ten cents' worth of morphine tablets, which may be taken with suicidal intent.

Dr. EARLY, Paducah: There is one point I would like to emphasize. Being the son of a minister, and having been associated with ministers of the Gospel, I feel like saying one thing for them and one thing about them. They are the most susceptible men on the face of the earth to imposition.

One reason why the country physician and the general practitioner do not send for the specialist is because they are afraid the specialist may be wanting to make a reputation and will cut when there is no need of it. If the specialists were always more conscientious than we think they are, possibly we would send for them more often than we do.

Dr. DOHERTY, in closing: The paper was not intended to hurt the feelings of any honest physician, but only to show the great evils that now exist, and to emphasize the fact that indiscriminate drugging and treating the disease without treating the patient should be abandoned as much as it is possible to do so.

TRAUMATIC TETANUS.

By John A. Lewis, M. D.

Georgetown, Ky.

In the brief presentation which I shall make of the subject of traumatic tetanus I shall present you nothing new or startling, nothing which has not often been said and better said by others who have preceded me in the consideration of this subject.

An interesting question in the investigation of any disease is its origin; whether the result of edict or accident; a question which has puzzled, and is likely to puzzle, the theologian, the philosopher, and the physician for all time. Perhaps equally as interesting and certainly more important is the question of treatment; but paramount to both of these is the subject of prevention.

In my investigation of traumatic tetanus I can not hope to throw any light upon its mysterious origin, nor can I help you much upon the subject of treatment; but upon the more important phase, that of "prevention," I trust that I shall at least be helpful. Indeed, in my estimation it matters little to us whence or how came the disease, if we can answer the more vital question, how to rid ourselves of it. The old methods of treatment, and I speak from experience, having run through the entire role time and time again from curare to chloral, are absolutely valueless. The new treatment by antitoxine injections is as yet on trial, and those of you who have the oftenest met this old adversary on the battlefield will be the slowest to accept the new treatment as a sure cure until thoroughly tested by honest and competent observers.

Tetanus is one of the oldest ills of the flesh—old as Hippocrates—vividly pictured by the father of medicine, fatal then,

fatal now. The burden, then, of this paper shall be, not how to cure the disease, as yet a hopeless task, but how to prevent it.

During the earlier years of my practice, which began thirty years ago, it was not an uncommon thing for me to meet with cases of traumatic tetanus. These cases generally had their origin in punctured wounds from nails or splinters, or from contused wounds, or from gunshot wounds, or from badly lacerated wounds, or from wounds from which the foreign bodies had not been removed. The offending cause was sometimes pieces of clothing carried with the ball, sometimes shot left in the wound, sometimes splinters, sometimes broken pieces of glass. I am sure that I am accurate in the statement that in the first twenty years of my practice I saw not less than twenty cases of traumatic tetanus in my own practice, or in consultation with other physicians in my vicinity. During the last ten years I remember of but one single case that has fallen under my observation. This occurred during the past summer, and occurred in the person of a lying-in woman following an instrumental labor, three weeks from the date of her confinement. She had seemingly entirely recovered; every abrasion of the surface had apparently healed. The patient had been discharged as well when the symptoms of tetanus developed. She died three days from the time of seizure.

The occurrence of this unfortunate case had the effect of bringing the subject vividly before my mind, resulting in an investigation of the subject, and incidentally resulting in this paper.

In my investigation of the subject, the first thing which arrested my attention was the apparent dropping off of the number of cases in the last ten years of my practice as compared with the preceding years.

Now, am I right in my observation that cases of tetanus are of less frequent occurrence now than formerly? I am sure such is the case in my own practice; whether it is a fact in the case of others or not, I do not know.

I am aware that tetanus has always been a comparatively rare disease; and yet I am of the opinion that investigation will show that I am correct in my statement. I only wish that I had had the subject sufficiently long under consideration to have collected data from which I might have adduced accurate statistics bearing upon the subject. In my opinion there are several reasons why we might legitimately expect a decadence in the number of these cases. The first and most prominent reason is that with the more general and extended use of anesthesia we are able to do better and more complete surgery than formerly.

The second reason is that under the influence of modern surgery as now almost universally practiced, wounds, after being freed from all foreign substances, are rendered thoroughly aseptic before they are dressed; in the third place, the pathology of the disease has been entirely rewritten, enabling us to act intelligently in preventing the disease. If you will recall the fact that the wounds which are more largely followed by tetanus are the punctured wounds, wounds from splinters, from rusty nails, wounds from pieces of glass, wounds that do not drain, contused wounds, lacerated wounds, gunshot wounds, wounds in which foreign bodies are retained, you will better be able to appreciate how modern surgery, under anesthesia, would insure more favorable results than under the old regime.

These wounds (many of them seemingly trivial) all require surgery to rob them of their seriousness. Formerly the pain attending the necessary incisions and explorations deterred both patient and family from any interference, and, with the application of some simple ointment or lotion, the wound was left to take care of itself. Thirty years ago the administration of chloroform or ether was not nearly so general as now. The practice of administering an anesthetic, except for the most important operations, was looked upon as extra hazardous. The majority of the profession were loth to administer anesthesia except in extreme cases, and when it was done it was with the gravest apprehension. The laity were strenuously opposed to the use of

anesthesia, and would not consent to its administration except in the most dangerous cases and unavoidable conditions.

Surgeons were not nearly so abundant as now; perhaps not more than one physician in each county town made any pretensions to the practice of surgery. The general practitioner rarely performed surgical operations of any importance. Indeed, he seemed quite content to be free from the responsibility which accompanied the practice of surgery. And when he called a consulting physician he rather enjoyed the spectacle of seeing him tread the wine-press alone.

As a natural result of this state of things, the majority of wounds which I have enumerated as most liable to be followed by tetanus were left to take care of themselves. Drainage was not established by free incision; pus was allowed to accumulate and burrow; wounds were so dressed as to favor infection; foreign bodies were overlooked, or left to be drawn out by some favorite poultice of fabulous drawing power suggested by some neighborhood male or female wiseacre.

All these things favored the production of tetanus. Now the surgeon (and as the result of advanced methods of teaching, and increased requirements for graduation, and post-graduate schools, every community is well supplied with excellent surgeons) promptly and fearlessly anesthetizes the patient, carefully explores the wound with his eye and his finger, not with the probe—for the probe, having served well its day and generation, has "fallen on sleep"—removes all foreign bodies, renders the wound thoroughly aseptic, establishes drainage, then puts the wound up in thoroughly sterilized dressings. A few years have wrought a wonderful change, especially in the management and treatment of wounds. The laity have been educated to understand that anesthesia is absolutely necessary for thorough surgery, and that the dangers attending its administration are not as great as those which we encounter every day in riding in a buggy or on a railroad train.

The now general use of anesthesia has robbed surgery of its terrors, opening the way for better and more thorough work. Asepsis has done the rest. And this statement speaks volumes; for no human power can estimate what has been accomplished in saving life and limb by the promulgation of the doctrine of asepsis as applied to modern surgery. The doctrine of perfect purity in dealing with wounds now seems so clear and simple that we wonder that a Lister had not arisen hundreds of years ago to have blessed the human family. And yet it has been left to our day and generation to witness the promulgation of a truth, the most simple and yet the most potent in the realms of human knowledge.

What can be more simple than the doctrine of asepsis? When summed up, it means nothing more nor less than the free and thorough application of hot water and soap, things with which we are supposed to have been slightly familiar all the days of our lives. How simple and yet how potent! What a complete revolution has been wrought in the science of surgery in the last decade by this simple means! If the giants of medicine and surgery of half a century ago could step into one of our modern operating-rooms of to-day and witness the advances made in the domain of surgery, progress made possible alone by the teaching of Lister, they would simply stand dumb with amazement. They could not believe their own eyes. They would involuntarily give utterance to that lofty sentiment which animated the soul of the immortal Morse when, with his great heart filled with expectancy, he transmitted the first words which ever passed over the electric telegraph, "Behold what God hath wrought."

The marvelous changes which have been wrought in the last quarter of a century have entirely altered the statistics as regards the frequency of traumatic tetanus. The scope of this paper does not include idiopathic tetanus, that form which is produced by causes other than wounds, generally exposure to atmospheric changes.

Traumatic tetanus presents itself under two distinct forms, either acute or chronic. The prognosis in these two varieties differs very largely. The acute form, or that which follows within a week or ten days after the reception of the wound, is violent in its convulsive manifestations, and is fatal in the vast majority of cases.

The chronic form generally ensues upon old injuries which have nearly passed out of mind, such as frostbites or old ulcers. Patients afflicted with this form of the trouble very often recover. I have myself seen one or two cases get well following this variety. I am of the opinion that the treatment has but little to do with the recovery—time seems to be the prime factor in bringing about the result.

Tetanus seems to be influenced by climate; the hot climates are more favorable to its production than the warm. Certain localities seem to favor the development of the disease. The black race seem more liable to it than the white. This may perhaps be accounted for by the fact that they are largely farm employes, and liable to have hands and feet infected from the soil.

Wounded soldiers who have lain on the battlefield all night without protection are prone to develop the disease. Until a few years ago the disease was looked upon as a nerve lesion, an ascending neuritis involving the spinal cord. In 1885 Nicolaier discovered the bacillus of tetanus in the soil; in 1886 Rosenbach demonstrated its presence in man. Since these discoveries the disease has been classed as an acute infectious disease. The bacillus is described by the investigators and writers on the subject as a slender rod with an enlargement at one end produced by the presence of a spore, rendering the appearance of the bacillus much like that of a drumstick. It is most frequently found in garden earth, gardens being generally manured from the stable, but sometimes in virgin soil, in street dirt, in the excrement of animals, especially horses. It grows rapidly at a temperature approximating 100° F. The spores resist a high degree of dry

heat for one hour, but are killed by a few minutes' exposure to moist heat at a boiling temperature.

The bacillus of tetanus is anaerobic (can not live in the presence of oxygen), hence the indication for incising freely all punctured wounds, allowing free access of oxygen, thus favoring the destruction of the tetanus bacillus. It is found in excrement of horses. This explains why wounds received by men about stables are more liable to produce tetanus, and why horses are more liable to tetanus than any other animal. It is found in dirt of streets and garden earth, and even in virgin soil. This explains why all wounds of the extremities, especially feet and hands, exposed to dust and dirt, are particularly liable to be followed by tetanus. It is estimated that three fourths of the cases of tetanus result from wounds of the extremities.

Now, if this little firebug (tetanus bacillus) is not the cause of the trouble, it is very certainly laid under grave suspicion, since it is found so constantly in the neighborhood of the conflagration. The bacillus of tetanus evidently enters the circulation through some abrasion of the surface, and yet it disappears from the point of inoculation in a few hours, and has rarely, if ever, been found in the blood or tissues of a tetanus patient.

It is impossible for tetanus to develop without inoculation through a wound, although the wound may be obscured. The bacillus does not seem to prevent the healing of wounds, and the wound may be closed before the disease makes its appearance. The period of incubation in this disease is one to two weeks, usually about one week. The presence of the bacillus produces several toxines which constantly produce the disease when injected into the healthy animal.

Perhaps the first and most prominent symptom indicating the onset of tetanus is stiffness in the jaw, from rigidity of the masseter muscles, also rigidity and pain in muscles of neck and spinal column.

The first indication which I have noticed in many cases is a feeling on the part of the patient of apprehension, as if some-

thing was impending, and yet not able to say just what. I have also noticed that rigidity of the recti muscles was one of the earliest symptoms, perhaps in some cases preceding the stiffening of the jaw and pain in muscles of back and neck. The muscles of the side corresponding to the wound are perhaps the first to become affected. The muscles are in a state of tonic contraction; added to this are paroxysms of chronic spasms or convulsions, excited by noise or slamming of a door, or breath of air. The patient during the intervals is free from pain, lies quiet, often bathed in perspiration, with a worn and exhausted look. The peculiar grin produced by contraction of muscles about the mouth is a familiar picture to all, also the violent spasmodic contraction of the patient, drawing them back, forward, or sidewise, according as this group or that group of muscles is involved. The temperature ranges from 100° to 110° F.; in some instances temperature rises after death; pulse rapid and weak. The intellect generally remains clear to the last. The patient is sleepless, rapidly emaciates from inability to take food and from profuse perspiration, the perspiration being the result of violent muscular contractions. Very few cases recover; perhaps 95 per cent die. They rarely live beyond two or three days from the seizure, and usually die from asphyxia.

The old method of treatment of tetanus by chloroform, bromides, curare, morphia, chloral, etc., availed but little. Under the old pathology, which looked upon the disease as an ascending neuritis involving the spinal cord, wounds were incised, actual cautery used, limbs amputated, etc., hoping in this way to sever the nervous reflexes originating in the wound. This treatment has been largely abandoned, because founded upon false pathology.

The treatment now consists in caring for the wound at once according to the principles of modern surgery. That is, the wound must have all foreign substances removed, drainage established, be rendered thoroughly aseptic, and put up in aseptic dressings.

Since Tizzoni and Cottani discovered the curative effects of the antitoxine of tetanus, the treatment has been conducted along this line. The protective serum is obtained by injecting animals, either dogs or horses, with pure culture of the germ until they become immune, and drawing blood-serum from them. This serum is used by hypodermic injection; twenty-five centigrams are injected twice daily. Such improvement is expected to occur within one week as to render further use needless.

Cures have been reported by this mode of treatment, but most of these cases belong to the chronic form, and are the same class of cases which we saw recover under the old treatment, and not those following acute wounds. The method is still on trial, and while much is to be hoped for it, nothing is yet certain. The only case which I have had in my practice since the serum-therapy has been brought to notice was treated by this method, but to no avail. There can be no question that tetanus can be best treated by prevention, "and fortunately the asepsis of modern surgery appears to be able to prevent probably as much by rendering wounds unfavorable to its development as by actual destruction of the germ."

If this paper should serve the purpose of enforcing upon every surgeon the necessity of submitting every wound which should come under his purview, no matter how trifling, to the strictest rules of modern surgery, I shall feel that I have contributed my mite toward banishing an enemy with whom we have thus far failed to battle successfully.

DISCUSSION.

Dr. Lecke: The essayist has given us a splendid paper, and I agree with him in most of the points he makes, but I am bound to say that I can not agree with him in the statement that medical treatment is of no avail. Without any notes in reference to the cases that I have had, I call to mind some cases of tetanus that occurred in my practice some years ago. One case occurred in a boy ten years old, who was following after a sickle, as the grass was being mowed, to

pick up sticks and carry the sickle from the stumps. He caught his toe and fell, and his forearm and wrist were badly cut. I amputated the arm just below the elbow as aseptically as I could under the circumstances. About ten days after the operation was done symptoms of tetanus set in. A consulting physician advised opening up the wound, but I could not find any thing in the wound to indicate that there was any trouble there, although the patient was in a state of contraction of almost all the muscles of the body, and slight rigors were running over him once in a while. I could not bring myself to open up the wound, and I put the patient on heavy doses of bromide of potassium and hydrate of chloral. These seemed to control the nervous symptoms. I kept him under that treatment about a week, and during that time the recti muscles were contracted so that there was considerable opisthotonos. The masseters were contracted so much that he had to be fed altogether upon fluid diet. The contractions remained almost constantly for about a week; they began to subside about that time, but continued to some extent until the boy was able to be out of bed; he could not open his jaws fully for a good while, but the case went on to recovery, and the patient is still living. The bromide of potassium and hydrate of chloral were just about all I gave him.

Dr. EARLY: I have a case I would like to put on record. A little boy eight years of age stuck a splinter into his foot; it was a very small one, but he showed the symptoms of tetanus in a few days. All the cases I had seen were fatal, the hydrate of chloral and morphine having been of no avail. The case getting worse, I sent for the antitoxin. Under its use the little fellow recovered. The antitoxic serum cured him, notwithstanding the splinter did not come out for about a week.

Dr. T. B. GREENLEY, Meadow Lawn: I have seen only three cases of tetanus. One was from a nail in the heel of a young lady, and another was caused by a piece of lead wire. In a third case I was called in consultation; this was an incised wound of the foot. The first of the two cases I mentioned got well. The child would have convulsions every hour or two. I had no hope, but I kept him under the influence of morphine, and sometimes under chloroform during the convulsions; he had locked jaws; he got well. Only one case died, and therefore I have some faith in medicinal treatment in tetanus.

Dr. F. J. YAGER, Campbellsburg: I did not understand the essayist to say that he would give no treatment, but that the main work we have to do is in the prevention of tetanus. I make no pretension to being a surgeon, but away back there I had a great many cases of tetanus to treat, and what surgery I did I believe I did well. I have had some cases of this trouble that came from wounds, and some seemed to originate in the brain. What caused those cases I do not know, but the disease killed my patients. The only ease I could give was with morphine and chloroform, and the patient would die under chloroform. I have had them with wounds from nails and incisions and contusions, and all that, and I have never lost one of them. If they had gotten a hold such as the doctor describes I would have had no hope. If the wound was in the heel, for instance, I would cut down, let the blood run freely, and then I would apply warm water freely; if possible, I would put the whole body in warm water, and then I would rub the part with carbolic acid; I would put the foot in warm carbolic acid water and keep it there all the time, and these cases did not get a firm hold. All the cases I have had I got hold of sufficiently early, and they all recovered. I would use your new remedies now, but I did not have them then. You must not think that because I stick to some of the old remedies that I am going to throw away any of your new ones.

Dr. DUGAN, Louisville: My cases of traumatic tetanus do not belong to me. They are on the other side. I believe the true treatment of traumatic tetanus is the prevention of it. This is a timely paper, and I consider it one of the most important that we have had. I arise more to express myself in hearty sympathy with it than any thing else. I believe that prevention is the keynote. The old idea that injuries to the hand and foot were more likely to swell up with tetanus was, in the first place, because such wounds became impregnated with the dirt of the barnyard containing the tetanus bacillus. And the reason we have better results is because we open up all wounds and cleanse them, and, having gotten rid of the cause of the infection, we do not have tetanus as we use to have it. When tetanus develops, in my mind all hope is lost. Notwithstanding I have always had the best physicians we could get and they have used the best treatment they knew, the cases have died. There is only one point I would like to make, which the doctor has omitted, and that is the use of the peroxid of hydrogen in these cases. He said that the microbe is anaerobic and does not live in oxygen. Then in all injuries

of the hand and foot that are infected with the excrement from horses, barnyard dirt, etc., it might be well to keep them open and pack them with gauze saturated with peroxid of hydrogen.

Dr. McCormack: I have seen six cases of traumatic tetanus in Kentucky, four in Louisville. The first five cases died by the methods of treatment then and still in vogue to a considerable extent. When I had my last case in Louisville I tried the anti-tetanus serum; we left the wound without packing, but obtained very free drainage. On the fifth day the patient had six convulsions, and I telegraphed for the serum and got it the next night. The next day he had eighteen convulsions, and that night I gave him 32 c.c. of the serum; I used the French serum to begin with. The next day he had sixteen convulsions, and the next night I used 32 c.c. again. The next day he had eight convulsions, and on the fifth day he had convulsions. After the fourth day I used only 10 c.c. of the serum, and after the fifth day he had only diaphragmatic convulsions; they were very painful, but that was all. His jaws remained locked until the eleventh day, and they were so completely locked that I had to have a tooth cut off, and through that space I poured with the funnel large quantities of fluid. The case was in an ignorant family, and I gave them a little bicarbonate of soda dissolved in a large quantity of water and had them pour this into the patient's mouth to keep up the secretion of the kidneys, because in all cases I have seen die there was suppression of the urine. The case made a splendid recovery.

Dr. E. E. Hume: I have heard a great deal about the curative influence of medication. We have heard also of cancer being cured, and we have seen cases where nature has exfoliated the whole cancer and the patient has gotten well. No doubt these cases have recovered, but whether or not they were cured by the medicine is a question in my mind. The value of the bromides was exhausted long ago. I have failed to see very much benefit from any medication, although I have seen two cases recover. But I have some doubt as to whether my treatment had any thing to do with the recovery in those cases. There is certainly an amount of the bacilli in the body already as well as in the soil that is received in these wounds. It is not always the punctured wounds that are followed by the development of the disease. I have seen one case in an amputation where the patient had been very badly mangled, and some slight sloughing had begun before amputation was performed. Five or six days after the amputation the symptoms of tetanus developed. The stump was

dressed openly with peroxid of hydrogen, as the doctor suggested, but still we had the development of tetanus. Sometimes we have the disease, no difference what is done to prevent it. As far as remedies are concerned, I doubt very much their value.

Dr. R. O. PRATT, Shelbyville: This question has a somewhat personal interest to me, and I wish to emphasize Dr. Lewis' position, that no wound, especially of the foot, can be so trifling but that it should receive prompt and thorough antiseptic surgical treatment. The prevention is every thing in this disease. After a case becomes established the value of medication is practically nil. It has been my misfortune to see three cases in the human and one in the lower animals, and all four died. I have tried the various remedies, the bromides as a rule, eserine and antitoxin, and they are all, in my experience, of no value. I am not prepared to deny the efficacy of antitoxin. In the case in which I did use it, it was used early, within five hours after the development of symptoms, and yet the patient died within twenty-four hours. I have known cases where the antitoxin was used in the lower animals with excellent results. The only point I wish to emphasize is the point so ably brought out by Dr. Lewis, that is, not to treat any case of injury of the foot slightingly.

Dr. LEWIS, in closing: I know cases of tetanus have occurred as stated, and have recovered under all sorts of treatment. I only doubt whether they recovered from the treatment. My own observation is that treatment is practically worthless. I only wished to bring before the Society the point I emphasized so strongly. Dr. Dugan brought out a very good suggestion in the use of peroxid of hydrogen. We know that the germ can not live in the presence of oxygen. Of course I did not mention every thing, and perhaps much I said might have been left unsaid, but I leave it to you.

THE PRACTICAL TREATMENT OF TYPHOID FEVER.

By Basil M. Taylor, M. D.
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You will please pardon me if I ask your indulgence in a paper on a subject that has been written threadbare in every medical society. Few indeed are the programmes that have no paper upon this disease. Though discussed by all, we have only approached the land, anchored in a small inlet, and picked up a few pebbles along the beach of knowledge of typhoid fever.

This is a disease that we all meet, and it claims its victims of all ages, from the cradle to old age; the weak and the strong, the rich and the poor.

I will not burden you with text-book theories or temperature charts (these you can get at your leisure), but will give you facts as they have come from original research. Neither will I discuss pathology; it is the patient and not the disease that demands our attention.

As typhoid fever is a self-limiting disease, we can not abort or even cure it. Those cases that are aborted are not typhoid fever. We are only nature's assistants, or else we are *particeps criminis.* In our treatment of disease we occupy one of two places: we either aid the patient or the disease. There is no neutral ground unless it is outside the patient's house.

When you weigh this statement carefully you will find it the truth. Every dose of medicine requires some antagonism. When the body is at war with disease, struggling for the survival of the fittest, every dose the patient takes necessarily occupies the attention of the organs of elimination.

Toxines and medicine alike pass out together. Then if our remedy is an irritant, upon which side do we stand? An enemy under false colors? These organs will quickly give you the alarm if you are firing at your own men. Pills and bullets are blind, and therefore wound friend and foe alike.

The coma vigil, wild delirium, thready pulse, revolting stomach all point with unerring finger to the mistakes in doses and diet. When the poor, miserable patient has the disease and the doctor both to fight, he deseves promotion if he survives the desperate attempts of both to kill.

You may think this a little harsh, but when you recall the lingering cases of typhoid fever on your list, you may well say that ninety per cent could have been different.

I do not mean those cases that have had Bright's disease or some chronic troubles that have already a closed mortgage on the patient, but those cases that begin with typhoid fever.

The course and duration of a case of typhoid fever depend upon the physiology and pathology of the patient and our conduct.

We all have the title of doctors of medicine, but in typhoid fever we are not doctors but judges.

We hold the same relation to the disease and patient as his "Honor" does to the plaintiff and defendant. We are not called upon to give medicine because we have that privilege, but to sit at the bedside and judge, as it were, the issues as they are presented—in fact, to keep out factions and party jealousy among the organs, and to bring the case to trial between germs and patient.

This means more than using the thermometer, feeling the pulse, or looking at the tongue; it means more than using text-books as our compass.

Each day of the disease is a day unto itself. The disease is divided into stages of weeks, but we must divide it into stages of days. Each day gives you light upon that day only.

One has wisely said, "The proper study of mankind is man." To be successful, then, "know your patient;" unless you do, he will not know himself long. When called to see a case of typhoid fever at any stage, open the journal and examine carefully his liabilities and assets. Like love that levels all ranks and hides a multitude of faults, there is one word in our language that covers all knowledge, though it be always hidden. This word is "Why." It is the Alpha and Omega in all consultations. It is a question I ask myself about every symptom.

At every bedside I am always twins, and we hold a consultation.

Is the patient older than his age? If so, why? Is he anemic or plethoric? If so, why? Is his temperature too high? If so, why? Is his pulse too strong, too weak, or too quick? If so, why? Is he nervous—full of pains and aches? If so, why? Is his tongue foul, his sweat acid, his bowels too active? If so, why?

There is no necessity for foul tongue, delirium, acid sweats, sick stomach, pains, headaches, insomnia, high temperature, and weak pulse in typhoid fever. If we will practice physiology instead of medicine, we will avoid these.

The sum total is, when you get a typhoid fever patient in bed give him a rest—I mean a rest from the crown of his head to the soles of his feet. There will be a drain on the system—a disturbance of the equilibrium between assimilation and waste. The patient lives on himself to a certain degree. Then we must minimize waste in every organ.

The patient's mind must not be upon his business; if he has been irregular in his habits, we must at once establish a regularity. In fact, we must as nearly as possible reorganize his organic harmony and let each organ do its work.

I do not mean that it is possible by anointing a man with clay, or by a simple touch of the hand to work a miracle and give him a new set of organs, but I mean if a man has been poisoning

himself or has been irregular in habits we can withdraw the poison and make regular his habits, and thus help the cause.

I have given you a few general principles preliminary to the treatment of a case of fever.

I will now enter into the treatment in detail. When I say in detail I do not mean the treatment of typhoid fever in general, but the treatment of the patient.

Let us divide our cases into two classes—first, those who were healthy prior to the acute disease; second, those who have had a chronic disease for years.

In the first class we are at an advantage, and in the second we are laboring under great difficulties. Case "A" is in the first class.

(A) He is a young man of twenty and a perfect type of physical manhood. He has been complaining for a week, and has called at the doctor's office several times for medicine; once or twice he found him with a degree or two of fever; he was given calomel for biliousness and quinine for possible malaria. He gradually grows worse, and after having a restless night with headache and general pains he sends for the doctor. Here is a chance for a brilliant success or a fatal and criminal mistake. He has a temperature of one hundred and three degrees; he has had a hard chill; his pulse is rapid but regular and good volume.

Now for your question, Why? The functions of the stomach are threefold—the trinity, as it were. They are digestive, absorbing, and germicidal.

To impair one necessarily impairs the other two. Here is the keynote to the whole matter. Keep in harmony with the trinity. The patient has taken medicine irritating to the stomach, and has been eating indiscriminately since the first symptom of his trouble, and the chill, high fever, and headache tell us of the facts.

Allow me to use here a theory for reference: "Give liquid nourishment and stimulants." Here is where we are deceived; stimulants are dangerous weapons indeed.

"A" is given another purgative, more quinine, and he is directed to take a glass of milk every three hours and a tablespoonful of whisky or brandy every four hours until you return. Have any of you ever been guilty of this mistake?

A stomach when in perfect health can not digest food long, oftener than three times a day.

But when the healthy stomach of case "A" takes typhoid fever it needs a rest for the long task it has before it. You cause it to work constantly by giving food every three hours.

What does this do? It breaks the link in the trinity by hindering digestion, and of course hinders the absorbing and the germicidal power of the stomach. This is kept up for a week or more until the patient begins to vomit. His temperature is running to one hundred and four or one hundred and five. His expression is dull, and he is delirious; his pulse is growing weaker, and you are increasing your stimulants.

When digestion and the germicidal functions are crippled, germs take charge of the glasses of milk, and the patient poisons himself hourly. Each glass of milk gives impetus to the trouble. No wonder it takes him weeks and months to recover; the disease and the doctor make a combination disastrous to any patient, though he be made of steel.

This is where the dull characteristic expression, the delirium, the tympanitis, the gurgling in the right iliac fossa, the feeble pulse, the emaciation, the aches and pains, the diarrhea come from.

Now, about the whisky you have been giving—here is another mistake—why? Because the pulse laboring under the poison from overfeeding is accelerated; you mistake this for an indication for stimulation. If any of you ride a bicycle or ever walk up a hill, you know that the best way to reach the top with little exertion is to walk or ride as slowly as possible, and thus save your energy.

But, upon the other hand, if you start from the bottom in a run and increase as you go up the hill you will find yourself ex-

hausted and unable to go further. So it is with the heart in disease. It needs rest instead of stimulation to overexertion. This causes heart-failure, and can not but result disastrously. Let the heart alone; it knows its own business better than we do. Never under any circumstances try to stimulate a weak heart's muscles. It only causes exhaustion. I have told you what you ought not to do, so I will now give you my treatment of case "A."

I never give a purgative. Why? Because there already exists an inflammation in the bowel, and it is unsurgical to cause severe muscular action over any inflamed area. Calomel in this case then is unsurgical.

If the patient is nauseated, I withdraw all food for twelve or twenty-four hours; then I feed him three times a day—not every three hours. If he is not hungry at the meal time, I direct him to wait until he has an appetite; this waiting will not occur very often. His food consists of beef tea, beefsteak scraped into a pulp or run twice through a meat-chopper and heated gently, crackers rolled fine, eggs either raw or cooked lightly, and soups in small quantities and highly nutritious.

Solid food, I know, is against the advice of every authority, but let us look into digestion. Does beefsteak pass out of the stomach a solid or a liquid?

Do eggs, milk, crackers pass out as solids or liquids? Milk, the great fever killer and the only reliable food, some advise, always becomes a solid after it enters the stomach.

So where is the difference? Solid food is not dangerous if it is taken in a condition and in a quantity that the stomach will digest. Never allow your patient to eat any thing that he is required to masticate, but always prepare meats and other food so that it needs only to be mixed with the saliva.

Then his stomach will digest perfectly the food, and the patient will be nourished and the germs starved, and his stomach will get the needed rest; and then there will be no self-poisoning from decomposed food that passes out of the stomach.

Orange or lemon juice at intervals will be grateful to the patient, and will do no harm. If there is no fermentation, the patient may take gelatin with rich cream over it. This gelatin and cream should be given in small quantities and on an empty stomach.

Let all food be highly nourishing and small in bulk, and easily digested; food that will leave the stomach in proper time and will not overstimulate gastric secretion.

When the temperature runs over one hundred degrees I use as an antipyretic antifebrin. I usually give three doses during the day and one at night if the patient is at all restless.

If the patient is a little restless for a few nights, I give him a sedative. I like bromidia very well, because it has no bad after-effects. As a rule, patients will rest well if the nurse will not disturb them every two or three hours during the night to give nourishment and stimulants.

This is a point that I wish to emphasize—avoid as much as possible disturbing a patient during the night. Rest is essential to health, and of course a patient needs it; let him sleep until he awakes of his own accord.

If the tongue is dry, I give for a day or two small doses of turpentine in capsules, or else I give a small dose of creosote or carbolic acid and tincture iodine. I have the patient's mouth cleansed three or four times a day and direct him to chew tolu an hour or two every day until the tongue becomes moist.

I direct him to take as much water as the stomach can conveniently absorb. As I pay special attention to the stomach, I do not forget the rectum and colon. These require as much attention as the stomach. I have the colon irrigated two or three times a day with warm sterile water, and if there has been diarrhea, I use boric acid or a very weak solution of permanganate of potassium.

These injections free the lower bowel and prevent any putrefaction or absorption, and thus relieve the system of what gives us that dull, characteristic expression, the foul tongue, and sordes

upon the teeth, the low muttering delirium that our text-books call the typhoid state.

I have the patient's entire body sponged in warm water once or twice a day. If a bath-tub is available, I have the patient immersed in the warm water, and the bath is kept up for ten to twenty minutes; the body is wiped dry and the patient returned to bed. A warm bath given at night produces sleep like a sedative. I never use cold water, for it is not grateful to the patient, and causes shock that is unnecessary.

I find that warm water has sufficient antipyretic effects. It keeps the skin active. If water is not taken by the stomach in sufficient quantities, I give an injection of about one pint of normal saline solution into the colon after it has been irrigated.

Case "B." This class of cases gives us much trouble, because we begin the struggle at a disadvantage, but we have an opportunity to use the same care and judgment as in case "A."

Most chronic diseases are in the lungs, kidneys, heart, or the alimentary canal. Those in the alimentary canal are the most difficult.

I have had consumptives pass through typhoid fever as easily as a robust patient, but dyspeptics are a source of worry to the physician.

We must watch digestion with special care. If there is myasthenia with fermentation we must give a very small amount of food, easily digested and slow to ferment. The white of an egg suits this class of patients best. The myasthenic stomach digests it better, and it usually leaves the stomach empty in two hours, and this leaves about sixteen hours rest for the stomach.

Do not give milk to a patient with weak digestive power. Antiferments may be given if necessary. Bismuth, turpentine, carbolic acid, or two or three grains of chloral act very well. The stomach-tube is the best prevention that we possess. If the stomach is irritable or there is hyperchlorhydria, give sedatives just before food is taken. A cup of hot water and a large dose of bismuth will usually prove efficient.

These cases improve as the food is decreased in quantity and quality. I have found that irritable stomachs with hypersecretions are the result of too much food improperly masticated or insufficiently cooked.

Complications must be watched for, and each met by proper remedies. The colon is irrigated, and the baths are used as detailed in case "A."

DISCUSSION.

Dr. J. B. HONEYCUTT: I think the essayist has overlooked one of the main points. He has overlooked antisepsis in his treatment. He also states that he would not use heart tonics. He uses as an antipyretic antifebrin, which I think should not be used at all. I do not think antifebrin, or any coal-tar preparation, has any place in the treatment of typhoid fever, and when an individual omits heart tonics in typhoid fever he will sooner or later find out that he is making a great mistake. In our part of the country we have typhoid fever all the time, and I have seen it in all forms, from walking typhoid fever to that severe form which will sweep away the patient no difference what you do. I do agree with the gentleman that we should not overfeed these patients, but I think we should take a lesson from nature, for we find nature feeds all her weaker subjects on milk.

Dr. W. B. GOSSETT: As to constipation, one point I want to bring out. When you first get a case of typhoid fever you do not want to purge, but move the bowels thoroughly with calomel and follow it up with sulphate of magnesia, and from that day on clear through move the bowels once or twice a day. Do not go two or three days and say the patient does not need any thing because there is nothing in the bowel, but move the bowels once or twice or three times daily. All you will need will be the calomel and the saline, such as sulphate of magnesia. As to disinfecting the bowel, we know the bowel is so long a tract that it is hard to get at the glands that are infected, but by keeping the bowels open we find the patient will do a great deal better, and will not have as great danger of hemorrhage as he would have otherwise. Now, as to the fever. If fever is 101° to 102½° F. or 103° F., you need do nothing for it. It is natural to have some fever, but after it gets over 103° F. you should reduce it.

For this purpose do not use any of the coal-tar antipyretics, but use ice, which will lower the temperature and at the same time stimulate the patient. Then as to diet. You should not starve the patient, nor should you feed at too short intervals, but three or four times a day. I think the best heart stimulant we have is strychnia, grains one-sixtieth to one-thirtieth, every three or four hours, and continue the strychnia throughout the disease and in convalescence.

Dr. GADDY: In the first place, the essayist neglected to speak of the cause of typhoid fever. I believe in order to treat any disease we should first know the cause and remove the cause, and then let nature, the great physician, heal the patient. You know typhoid fever has long been recognized as a germ disease due to the bacillus typhosus, the bacillus of Eberth, located in the glands of the bowels, Peyer's patches. Constipation, I contend, is one of the prime causes of typhoid fever. Constipation does not necessarily put the germ there, but it holds it in close contact with the mucous membrane of the bowel. My idea of treatment, then, would consist, in the very beginning, in giving your patient not necessarily a severe purge, but give him a dose of calomel and podophyllin, and never neglect the podophyllin, which we all recognize as an efficient cholagogue, to produce a flow of bile, which is nature's antiseptic. Then I agree with the doctor concerning the daily moving of the bowels. Feed your patient, and never forget the liquid diet, especially milk. I must disagree with my friend Dr. Taylor as to giving any coal-tar preparation to control the temperature when the heart is weak. I would never give them under any circumstances to a typhoid fever patient, because they depress the heart and increase the liability to death. On the other hand, I would reduce the fever by Brandt's system of bathing. Under his system of bathing Brandt claims to cure 99.5 per cent; that is, there is only one half of one per cent of mortality under the system of bathing as practiced by Brandt. Under the system practiced by Osler and other distinguished American authorities, the mortality is about three fourths of one per cent. Bathe the patient with warm water or with cold water. As to which we shall use, we must consult the individual peculiarities of our patient. Some patients want warm water and find cold water irritating, and others prefer cold water.

Dr. THORNTON: Some points in the doctor's paper I want to commend, and regarding some points I differ from him. So far as antifebrin is concerned, or acetanilid, which is not the patent medicine, I have used it in typhoid fever frequently. I do not use it after the

heart begins to flag. But I have found that nothing will relieve the headache or quiet the patient so well as acetanilid. Then, later on, leave the antipyrin or antifebrin or acetanilid off. I believe the acetanilid has some antiseptic effect on the intestinal canal. I have treated many cases, and they have not turned out like the cases of cerebro-spinal meningitis that have been reported. Most of my cases got well. In starting with a case of typhoid fever, we can not always see the case early, and there I believe is where the mortality is increased in typhoid fever. You will remember that Brandt says that those cases that fail to recover come under treatment after the fifth day. The patients feel a little bad and think they will feel better the next day, and keep on working for days and days. Finally they die from perforation or from hemorrhage. I would say to use calomel in repeated doses, not as a purgative, but to cleanse the bowel. Then if you will bear in mind the etiology and pathology of typhoid fever and will agree that the bacillus of Eberth is the cause, located in Peyer's patches, and these patches are found to be infected, showing first one involved and later more involved, and showing that not all are involved in the same manner, you will see the logic of using antiseptics. With the passages from the bowel the germs are thrown off. If you leave the germs in the bowel, by force of number they will invade fresh tissues, and this is the reason why typhoid fever is continued for six weeks, and two months in some cases. We can not kill the germs *in situ*, for they are behind the breastworks, but you can make the intestinal tract so unhealthy for them that no new glands will become involved, and thus you will cut the disease short. You will not abort the disease, but you will limit the invasion to the glands already involved, and the patient will be on the highroad to recovery in from ten days to two weeks.

Dr. BATE: We know in the second week the solitary follicles become swollen and enlarged. Then at the end of the second week and beginning of the third week we have two possibilities to take place: Either this enlarged gland becomes soft, and we do not have ulceration, or we have the breaking down of the gland and ulceration. Huchard has shown that coma and the formation of gas is dependent upon this auto-infection, and when that is removed we do not have these symptoms. The infection of many of the glands is absorbed without ulceration taking place.

Dr. TAYLOR, in closing: Now, as to the use of a heart tonic. Under the treatment I have outlined the patient is not poisoned by overstimulation or overfeeding and the reabsorption of waste products

in the bowels. I move the bowels twice a day by high enemata, and thereby prevent any absorption of waste products. The kidneys are kept flushed. And if the heart is strong, what need have we of heart stimulants? Of course if the pulse-rate increases to 150 or 160 per minute, we must give the patient something, and let him get out of the way as soon as possible. Without auto-infection you will not have a temperature over 101° F. It is the absorption of waste matter from the bowel that gives the extra three or four degrees of fever, and if you get away from that, what do you need of baths or any thing of that kind? I use warm water. Antiseptics are not needed when you practice asepsis. With care of the stomach and digestion you have no tympanites. Of course if you give food every two or three hours, and have the disease continue several weeks, then it is different. But all you need is to let the patient get well.

INTRA-OCULAR TUMORS.

By Adolph O. Pfingst, M. D.
Louisville, Ky.

In selecting the subject of intra-ocular tumors, I was influenced by a desire to present to the Society three specimens representing growths within the eyeball at different stages of development, and to point out in particular some of the clinical features accompanying conditions of this kind.

While a variety of tumors are frequently observed within the orbit, those occurring within the eyeball itself are practically limited to two varieties, viz., sarcoma—occurring in the adult mostly between the fortieth and the fiftieth year—and glioma, occurring in children from birth to the tenth year. Exceptionally carcinoma, fibroma, adenoma, and myoma have been observed originating in the eye. Intra-ocular sarcoma may take its origin from any part of the uveal tract—pre-eminently from the choroid coat. It does not differ materially in its make-up from sarcoma occurring elsewhere, and hence does not demand special microscopic study in this brief treatise. I would, however, point out the fact that by far the greatest number of these growths in the eye are heavily pigmented, the unpigmented variety, or the so-called leuco-sarcoma, occurring but once in every ten to fourteen cases.

Much uncertainty has existed and still exists as to the histogenesis of glioma. It is notoriously a growth of infantile life, and is, according to the latest researches, believed to result from a hyperplasia of the neuroglia cells of the retina. It is the only variety of tumor that originates in the retina. Macroscopically it resembles brain substance, having a spongy texture and a pinkish-gray color. Microscopically it is made up of closely-crowded round cells with large nuclei and a very scant amount of

protoplasm. The cells are imbedded in a slightly granular basement substance. Intra-ocular growths, while they are not common, occur frequently enough, so that many of the members present have no doubt had occasion to observe such cases. Clinically we can consider glioma and sarcoma together, for they run almost an identical course. According to Knapp and others, their development has been divided into four stages. In the first stage, the period of latency, the tumor often remains undiscovered, slight defects in vision due to opacities in the humors of the eye being overlooked. Complete and sudden blindness sometimes results from a detachment of the retina, to which development tumors predispose. If the tumor invades the macula, blindness also results. An area of defect in the visual field which develops sooner or later, unless the tumor is situated far forward near the ciliary body, is often the first symptom noticed by the patient. Glioma, occurring as it does in infancy, when the faculty of observation is not well developed, does not fall into the hands of the physician as early as sarcoma. They usually go along until symptoms of inflammation or increased tension arise which usher in the second stage, that of intra-ocular tension.

When glioma has reached a sufficient size to cause increased tension, it is large enough nearly always to be seen through the pupil as a golden-yellow reflex behind the lens. It is not uncommon for this reflex to be noticeable earlier, and to lead thereby to a diagnosis in the first stage. In the second stage the patient usually complains of much pain in the eyeball, temple, and occiput severe enough to prevent sleep and at times to cause nausea and vomiting; in fact, all of the symptoms of acute glaucoma are usually present. The pain may be constant; usually, however, it remits. The eye becomes reddened from distension of the episcleral vessels, which also appear more tortuous than usual. A marked zone of injected vessels encircles the cornea. The eyelids are puffed more or less; the cornea is hazy or steamy; the contents of the anterior chamber cloudy. The pupil is nearly always wide and rigid, while the lens is carried forward with

the atrophied and discolored iris, causing thereby narrowing of the anterior chamber. Intra-ocular tension is much increased. These symptoms disappear more or less completely when the growth perforates the tunics of the eye. In this, the third stage, the pseudoplasm perforates the sclera or the cornea and invades the surrounding orbital tissue, while the eyeball becomes shrunken and displaced laterally or forward. As long as the growth is covered with conjunctiva it is smooth, and often has a bluish hue. But after the conjunctiva breaks, a moist ulcerative surface is exposed which bleeds easily, and is usually covered with dried, crusty secretion. Its growth after perforating the eye is more rapid, and after a short period luxuriant growths may be found in the nose, cheek, or interior of the skull. Glioma not infrequently extends along the optic nerve and causes, upon reaching the chiasm, a bilateral blindness, accompanied at times by symptoms of cerebral pressure, viz., headache, vomiting, muscular twitching, etc. After the orbital tissue has been encroached upon, it is common for metastatic growths to develop at remote parts of the body, notably in the liver. This constitutes the fourth stage of development. Sometimes metastasis occurs before the tumor has perforated the tunics of the eye.

In the earliest stage of an intra-ocular growth the diagnosis is not frequently made, especially where its location does not cause a scotoma in the visual field. If the defect in the field brings it under the observation of the ophthalmologist, the diagnosis can be made with the ophthalmoscope. In the second stage the presence of a tumor can readily be and is often mistaken for acute glaucoma. If, simultaneously with glaucomatous symptoms, a mass can be recognized in the interior of the eye with the ophthalmoscope, the diagnosis is easy, or even where with symptoms of glaucoma a detached retina can be made out a tumor may be suspected, although it is possible for the tension to be increased during a simple detachment of the retina.

In some cases the fundus is obscured by opacities in the vitreous or by a cataractous lens, and an ophthalmoscopic diagno-

sis not possible. The presence of ciliary neurosis, the pushing forward of the iris, and the injection of the scleral vessels, along with the increased tension, would in such cases have to be relied upon to make the diagnosis.

In differentiating between acute glaucoma and the presence of a tumor, the history of the case must be taken into consideration. A sudden onset without a defect in the visual field would not point to the presence of a tumor.

In the third and fourth stages of an intra-ocular growth the diagnosis is, as a rule, not difficult.

During childhood a number of inflammatory eye affections lead to plastic or purulent deposits in the vitreous, which resemble closely in appearance a gliomatous mass after it becomes visible behind the pupil. These conditions, which as a class have been termed pseudo-glioma, have frequently been mistaken for true glioma. The most frequent cause of deposits in the vitreous is cerebro-spinal meningitis, although the exanthematous fevers, diphtheria, whooping-cough, and syphilitic affections are not uncommon etiological factors.

Importance should be attached to the history of such cases. A previous inflammatory condition of the eye, with the presence of some of the results of inflammation, such as adhesions of the iris to the lens capsule, retraction of the iris at the periphery, along with the yellow deposit in the vitreous, would almost suffice to make a diagnosis of pseudo-glioma. The diminution of tension in pseudo-glioma and its almost constant increase in true glioma will further aid in differentiating between the two.

Glioma and leuco-sarcoma sometimes resemble each other so closely that they may also be mistaken for one another. The age of the patient would of itself be suggestive of the nature of the growth. However, as we know that sarcoma can occur in children, we have to depend largely upon the ophthalmoscopic diagnosis and the appearance with direct focal illumination. While leuco-sarcoma appears as a dull, white mass, or, if accompanied by a detached retina, as a mass covered with irregular bluish folds,

glioma shows the characteristic metallic yellow. Sarcoma forms a more sharply defined mass than glioma as a rule, and is not marked by the same regular ramifications of vessels on its surface, as glioma.

As compared with growths of the same character at other situations, the prognosis of intra-ocular sarcoma is much more favorable because of the possibility of removing it early and completely before it has encroached upon surrounding tissue. But, notwithstanding early removal by enucleation, recurrence of the tumor at some near or remote point is the rule. In those cases not submitted to operation, death takes place after a shorter or a longer period, in the third or fourth stage, from exhaustion.

Glioma is very malignant and terminates fatally in a few years in operated cases, as well as those not brought to operation.

It is hardly necessary to add that the earliest possible enucleation of the eye, or where the orbit is involved an evisceration of the orbit, is the course of treatment that should be pursued.

The first of these specimens * is a melanotic sarcoma of the choroid which I removed with the eye from a man forty years old on August 16, 1897. The growth, which is situated very near the optic nerve, is, as you will see, very small (14 mm. x 12 mm. x 8 mm.). It had just entered the second clinical stage, the eye having been free of inflammatory symptoms until three weeks before, when it became painful and tense. The location of this tumor would have made its ophthalmoscopic diagnosis easy in the first stage had the patient presented himself earlier.

The other specimen, removed from a man forty years old on August 30, 1897, represents a melano-sarcoma at the end of the second stage, the entire vitreous cavity being filled with a black mass. The patient had suffered pain in the eye and temple of the affected side for a year. When the member was enucleated the intra-ocular tension was much increased.

The other eye was removed from a woman fifty-four years old in August, 1898. The specimen is rare, in that it is a typical

* The specimens were prepared, according to the method originated by Priestly Smith, by Dr. Smyth of this city

representative of the non-pigmented variety of choroidal sarcoma. It was removed in its third stage, having perforated the sclera in several places anteriorly, as the specimen shows. The strange coincidence that brought three intra-ocular tumors under my observation in one year, two of them two weeks apart, should not be taken as a criterion of the frequency with which this comparatively infrequent affection occurs.

So far there has been a recurrence in none of the three cases reported, and while I feel hopeful of a permanent cure, or at least a lengthier interval before recurrence in the first case, which was removed while the growth was still small, we must, based upon experience of many authors, expect a recurrence in all of these cases.

THE MATERNA: A NEW DEVICE FOR THE HOME MODIFICATION OF MILK.

By Henry E. Tuley, A. B., M. D.
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Infant feeding has received much attention during the past year from various writers, and it is gratifying with what unanimity is cow's milk recognized and advocated as the best substitute for mother's milk when it becomes necessary to feed a child artificially. The advances made have been in the direction of an easy and correct method of home modification. It is gratifying that the Walker-Gordon laboratories are being established in all the larger cities, and we hope shortly to have one in Louisville; but even these, where available, are denied many on account of the cost. The method of artificial feeding which will prove most popular with the laity must embody two requisites—cheapness and ease of preparation. Upon the physician, then, devolves the great burden of educating the people beyond the indiscriminate use of proprietary foods and the importance of accuracy in preparation of the food prescribed. The best food, almost without exception, is cow's milk.

Unfortunately, the average physician has not learned the importance of thinking of cow's milk, as capable of modification to meet the needs of the child, beyond the vague instructions to add a little water for the sake of dilution. He has not learned to think in percentages—the first principle of milk modification. Nor that the adaptation of percentages can not be governed by the age of the child, but the individual capacity of the child to digest the milk made after certain formulæ.

When this has been learned, the best method of modification is to be adopted, and the latest developments have been in the

direction of simplifying that process. The ideal method is, of course, by the Walker-Gordon laboratory, when this is available; for the laboratory has certainly come to stay—a prediction made by Dr. A. C. Cotton, in his address as Chairman of the Section on Diseases of Children, at the Atlanta meeting of the American Medical Association.

When home modification has been decided upon, most excellent results can be had from the method suggested by Dr. Wm. L. Baner in the New York Medical Journal. There have been many methods suggested, all embodying some arithmetical calculation, more or less simple, but in the writer's hands none has proven so simple and satisfactory as Dr. Baner's.

Looking to a greater simplifying process of home modification of milk, Estraus, a New York merchant, has devised a simple apparatus which he has called the materna. This consists of a glass graduate on which are seven panels, with horizontal lines marked on the different panels to indicate the amount of each ingredient of a milk mixture to produce different percentages of the milk. The formula given at the top of each panel requires for its make-up skimmed milk, twenty per cent cream, sterilized water, and sugar of milk.

An objection urged by Dr. J. P. Crozer Griffith to the original model was the marking on the different panels of certain weeks and months to indicate the age at which the milk is to be changed to a stronger mixture, which he stated placed too much power in the mother's hands. Upon his suggestions the new model will not include these markings, the various formulæ being indicated by numbers.

A milk mixture made with this instrument will analyze, chemically, the same as the different formulæ on the panels.

Should a total quantity of thirty ounces be desired, the materna must be filled twice, there being little waste, as this holds a total of sixteen ounces, and so on.

VITAL AND MORTUARY STATISTICS OF KENTUCKY FOR 1898, PRORATED FROM THE NATIONAL CENSUS OF 1890.

By T. B. Greenley, M. D.
Meadow Lawn, Ky.

In the first place I will speak of the population of the United States and its decennial increase since 1790. In that year the population was 3,929,214. In 1800 it was 5,308,483; increase 35.10 per cent. In 1810 it was 7,239,881; increase 36.38 per cent. In 1820 it was 9,633,822; increase 33.07 per cent. In 1830 it was 12,866,020; increase 33.55 per cent. In 1840 it was 17,069,453; increase 32.67 per cent. In 1850 it was 23,191,876; increase 35.87 per cent. In 1860 it was 31,443,321; increase 35.58 per cent. In 1870 it was 38,558,371; increase 22.63 per cent. In 1880 it was 50,155,783; increase 30.08 per cent. In 1890 it was 62,622,250; increase 24.86 per cent. In the census of 1890 there were males 32,067,880, and females 30,554,370; whites 54,983,870, colored 7,638,038.

Death-rate of the whole population, 12.85 per 1,000; whites 12.20, and colored 14.24.

It will be seen that there has been a pretty regular decennial increase in the population of the country except the periods included in the wars of 1812 and 1861, when of course there was a diminution of increase due to natural causes. There was also a falling off in the regular increase during the period from 1880 to 1890. But no doubt this was due to the fault of the census takers in omitting a large number of the population, as we had no wars or epidemic diseases to produce such a result.

When I come to speak of the population of Kentucky, I shall endeavor to show a great defect in this particular.

The number of children born during the last census year, 1890, was 1,670,821; deaths under one year, 197,167, and under five years, 307,562; stillborn, 34,102. Deaths among all classes, 875,521; males, 464,330; females, 411,191. Death-rate: Whites, 13.98; colored, 15.30. Principal diseases causing death: Typhoid fever, 27,058; malarial fever, 18,594; diphtheria, 27,815; diarrheal diseases, 74,711; consumption, 102,199; pneumonia, 76,-496; cancer and tumors, 20,984; heart disease and dropsy, 55,029; diseases of the nervous system, 89,974; diseases of the urinary organs, 23,652; old age, 16,591; all other diseases, 250,080.

Population of Kentucky in 1890 was 1,858,635; white, 1,590,462; colored, 268,173. Births in 1890, 52,015. Deaths under one year, 3,231; under five years, 5,802; deaths of all ages, 23,897; whites, 19,398, and colored, 4,479. Ratio per 1,000: White, 12.20; colored, 16.70.

Principal causes of death: Scarlet fever, 105 cases; typhoid fever, 375; malarial fever, 400; croup, 259; diphtheria, 385; diarrheal diseases, 948; measles, 207; whooping-cough, 207; cancer and tumors, 286; heart disease and dropsy, 651; liver diseases, 127; diseases of the nervous system, 1,065; urinary organs, 277; old age, 413; stillborn, 390; all other causes, 3,718.

Now I wish to speak of the defect in the census of 1890. It will be observed that from the first census in 1790 the decennial increase amounted to an average of over 34 per cent up to 1870, the first census after the civil war, which was 22.63. This low increase is easily accounted for as the effect of the four years' war.

In 1880 the increase came up to over 30 per cent, and in 1890 went back to 24.86. Now, how is this great falling off in population increase to be accounted for? Why, only on the ground of failure on the part of the census enumerators to list all the inhabitants. There were no epidemic diseases in the country that year or during the decennial period calculated to

diminish the number of our population. The death-rate was quite low, being only 13.98. From the consideration of these facts it can only be inferred, as before remarked, that a large per cent of the population was not enumerated.

Now we will speak of Kentucky. Our population in 1880, according to the census of that decennial period, was 1,684,600, and the returns of 1890 only gave us 1,858,600. In 1870 we had a population of 1,321,000, and, as above stated, 1,684,600 in 1880, an increase of 363,600, or 27.50 per cent. Now, if we had increased in population at the same ratio during the decennium from 1880 to 1890 as we did from 1870 to 1880, we should have had a population of 2,148,000 in 1890, and at the same ratio of increase we should have next year 2,719,000.

Since the period from 1880 to the present there has been a great increase in business enterprises — many factories have sprung up and a great increase in mining operations, to say nothing of agricultural and commercial matters, all of which is greatly calculated to induce immigration to the State.

We have had no epidemic diseases to curtail the number of the people more than the ordinary diseases. Our greatest epidemic was the yellow fever of 1878, which was two years previous to the time we are alluding to, and occurred during the decennial period in which we had an increase of 27.50 per cent.

Now, the only inference we can draw from these calculations is that over 200,000 of our population were left out in taking the census of 1890. Had all of our population been tabulated, our death-rate would have been much lower than stated. Another material error was made in enumerating the colored population in 1890, which only gives 268,173, whereas the census of 1880 gives 329,000. The births among the colored folks that year were 7,504, of which number 514 died the same year. We are well satisfied of the fact that the negro population did not decrease in numbers, but, on the other hand, greatly increased during the ten years. It is to be hoped that the census to be taken next year will be more correct.

My main object in writing this paper is again to draw the attention of our profession and philanthropists to the fact that our great State has no census reports of her vital and mortuary statistics. We have the old law of 1874 still extant, slightly modified or improved, but it seems but little attention is given it. I have seen no reports published.

The law of 1874 is very good if it was observed by everybody concerned, but it is not sufficiently plenary in its provisions to induce due observance.

For ten years I reported births and deaths, complying with the law, handing the reports to the county clerk, who was to forward them to the State Auditor to be embraced in the publication of his annual reports. But if any were ever published I am not aware of it.

It was said that many of the reports were not forwarded, as the clerks received no remuneration for such work.

I think the reports of births and deaths should be made compulsory on the part of physicians and midwives, allowing them a certain fee for their trouble. But I apprehend but few of our physicians would receive a compensation for such work. Professional pride would be a sufficient inducement to comply with the law. All they would ask for would be blanks furnished them.

I think the whole matter should be under the direction and control of the State Board of Health. The reports should be forwarded to the Secretary direct, and their publication super vised by him, and due compensation allowed him for his work.

Kentuckians are a proud people, and should not be satisfied to be in the rear of any other State. We stand high in every particular except knowledge pertaining to the character of our diseases causing death, and increase of population by the birth-rate. In every other respect we stand equal to any of our neighbors, and in some things ahead.

The old Bluegrass State ought to get a new move on herself and take as much interest in the affairs pertaining to the welfare of her population as she does in all departments of business

affairs. Above every thing, our profession should not allow our standing and achievements in the past to become dimmed or tarnished by neglect of present duty.

We are proud of our professional renown, being, in this particular, ahead of any other State. We should be stimulated by recalling to memory the names of Brashear, McDowell, Dudley, Drake, Gross, the Yandells, and many other noted medical men.

Louisville is the only city of the State where regular reports of births and deaths are made, the report of births being only a recently enacted ordinance.

It is to be hoped that an effective law will be enacted by our next legislature by which we can have correct reports of our vital and mortuary statistics.

The report of the health officer of Louisville for last year is very favorable for the sanitary condition of the city.

The population is estimated at 225,000, which is, no doubt, very nearly correct, the number of whites being 184,950, and the colored, 40,050. The death-rate for the whole population was 13.59 per 1,000 inhabitants, the white being 11.85 and the colored 21.62. This rate is a fraction lower than that of 1897, it being 14.40 for the whole population; white, 13.60, and colored, 20.00.

I intended to give a prorated statement of vital and mortuary statistics of the State for last year from the census of 1890, but, on account of the error on the part of the enumerators, such a report would be of little utility. I will, however, state what it is under the imperfect census of 1890. At the same ratio of increase as took place from 1880 to 1890, our gain would be 410,000, making the population for the year 1898, 2,268,000.

PHYSICAL EXAMINATION FOR LIFE INSURANCE.

By Allen H. Kelch, M. D.
Louisville, Ky.

One central idea should characterize every examination made for life insurance, viz., "will this applicant, barring accidents and acute diseases, live his life expectancy?"

To determine this question with reasonable certainty involves the consideration of problems at once complex, delicate, and oftentimes difficult, and the responsibility which rests upon the examiner's judgment can not in most cases be regarded otherwise than as considerable. It involves the profit or loss, in most cases, of large sums that go to make up the success or failure of organizations, which, properly conducted, rank among the most beneficent institutions of mankind, and long after the verdict of the examiner has been pronounced may involve the comfort and happiness of the family dependent upon the efforts of the insured.

Fortunately, there are but two possible errors to commit in conducting such examinations—one in either direction—but the consequences of either committed are equally deplorable.

First Hypothesis. An applicant presents himself for examination with the honorable purpose of providing at his death a competency for those near and dear to him, and willing to pay throughout his expectancy for that benefit; on insufficient grounds he is rejected. Consequence: Here is an applicant wrongly condemned and deprived of the honorable purpose he intended to pursue, and perhaps at his death his family is deprived of the inheritance he would otherwise have bequeathed to them; and the insurance company at the same time deprived of business which would have been a source of profit to them.

Second Hypothesis. An applicant presents himself for examination, apparently healthy, who from an antecedent syphilis insufficiently treated remains subject to all the dangers of an invasion of the brain, heart, or other important organ, and this danger overlooked, he is accepted and later dies, when only half his "life expectancy" shall have passed away. Consequence: The whole transaction becomes a matter of the closest scrutiny on the part of the company, who is the loser by it, and perhaps an action-at-law, which, if it does not invalidate the claim, results in an enormous depreciation in its value by reason of the expense attached to litigation.

An error committed in either direction thus works injustice to one or other party to the transaction of life insurance.

Thanks to our science, our present knowledge of pathology and the sequelæ of diseases, and the influence of heredity, and our skill in applying these sciences, it is ours to eliminate these errors at the present almost entirely; if not entirely, we are at least able to reduce the loss many thousands of dollars yearly through the premature death of applicants who ordinarily present to the unaided senses not even the incipient manifestations of grave disorders inherent within the human system.

A digression for a paragraph will be pardoned, I hope, by this assembly when it is known it is for the purpose of emphasizing the point that it is as physicians—and as physicians exclusively—representatives of medical science only, regardless of every extraneous consideration, of the personal benefits, of the arguments of agents, of friendship, of every thing except the central idea of "life expectancy" and the probability of reaching it, that our examinations should be conducted. Cool as the calculation of mathematics and pure as the driven snow should the conscientious physician let the light of his science shine upon the subject under consideration, that he may have the correct data upon which he is to form a judgment, which becomes a compact and an agreement between the applicant and the company which he represents. This digression would be unnecessary but for

the fact that we, as physicians, must deal with men as they are, not as we would have them be.

Without further remarks, then, your attention is invited to what, in the judgment of the writer, constitutes such a physical examination as would likely yield the best information on which to formulate an opinion which has a reasonable value.

System, which affords the minutest attention to detail with celerity, is the secret of success in most of the extensive operations of business, and a good one applied to physical examination affords a comprehensive view of every important feature about an applicant.

Such a system should be skillfully framed to begin with, and when so formed should be strictly and rigidly adhered to until there is manifest an exceptional reason for departing from it. A good rule would be, "Never depart from it."

Such a system should comprehend, first, an inspection of the body of the applicant as a machine destined to perform the duties incident to his occupation under normal conditions of usage and care for the term of his life expectancy, and such inspection should be conducted with the applicant in the nude condition, because in that condition many important factors may be determined. What are they? For the sake of brevity they may be placed in a series:

1. Symmetry. 2. Nutrition. 3. Respiration. 4. Skin. 5. Scars. 6. Hernia. 7. Hydrocele or Varicocele. 8. Edema. 9. Joints, muscles, and tendons. 10. Marks of injuries or operations. 11. Varicose veins. 12. Glandular system. 13. Hair, nails, and palms. 14. Rectum: (*a*) tumors, (*b*) fissure, (*c*) fistula, (*d*) stricture, (*e*) discharge or ulceration. 15. Condition of the clothing as denoting stricture or incontinence of urine.

Really quite a respectable array of facts determinable without the exchange of a single word. Indeed, it should be made a rule never to ask the applicant a question which the examiner can determine without; and with practice a degree of certainty and celerity may be acquired which in its higher manifestations

appears little short of magical. The pulse-rate and respirations per minute sitting, standing, and on exercise can be quickly taken, as well as the temperature, height, weight, age, and social condition.

Lest any thing shall have escaped the critical eye by inspection, each vital organ should in its turn be the subject of scientific scrutiny, and here system particularly favors both accuracy and celerity.

Arranged in series again and separately considered should be each system: 1. Circulatory. 2. Respiratory. 3. Digestive. 4. Nervous. 5. Urinary. 6. Lymphatic.

As to the heart there should be noted: 1. Apex impulse located. 2. Visible or not. 3. Area of apex impulse. 4. Area of cardiac dullness. 5. Sounds. 6. Force. 7. Rhythm. 8. Hypertrophy. 9. Dilatation. 10. Dyspnea. 11. Cyanosis. 12. Edema, local.

As to the blood-vessels: 1. Atheroma. 2. Dilatation. 3. Aneurism. 4. Varicosities.

These facts determined and noted, there remains nothing of the circulatory system for present consideration. The respiratory organs then engage attention in the following order, respiration per minute having been already noted:

1. Condition of the nose, nasal septum, and turbinates. 2. Pharynx. 3. Cough. 4. Inspection of the vocal cords. 5. Symmetry of chest. 6. Measurements at rest, on forced expiration and inspiration. 7. Râles. 8. Vesicular murmur—area. 9. Consolidations. 10. Adhesions. 11. Cavities. 12. Rhythm of inspiration and expiration as denoting asthma, which would be attended by bronchitis, cough, and perhaps dyspnea on exercise.

In regard to the digestive system there should be noted:

1. Nutrition. 2. Condition of the teeth. 3. Tongue. 4. Skin. 5. Liver. 6. Spleen. 7. Rectum, as to: (*a*) tumors, (*b*) fissures, (*c*) fistula, (*d*) stricture, (*e*) discharge, (*f*) ulceration, as denoting the condition of the digestive tract.

The nervous system, comprised of the brain and spinal cord, regardless of the sympathetic system, affords an excellent opportunity for the examiner to demonstrate his perceptive abilities, because, in addition to the structural changes determinable, the mental operations must be considered, and the conceptions of the individual, which we call ideas, and which through volition are by them converted into deeds and realities, may be regarded the products of brain action, as in like manner the stimulus to muscular contraction may be considered, through volition or otherwise, the product of action by the spinal cord.

This system must then be looked upon from a double standpoint—first, from evidence of structural lesions, and, second, from aberrations of function.

Viewed from the first, it is essential to determine the apparent conditions of the brain and its membranes, and the evidences of diseased conditions if they exist. Here we are deprived of most of the ordinary means of determining the structural conditions of an organ contained within a protecting membrane. Percussion can not avail us; auscultation is useless; the applicant can not inform us; and we are driven, as a last resort, to the interference with function, as manifested in the perceptions and mental operations which constitute its function, and the condition of the various branches which reach out from it to conduct the operations of the special senses.

Fortunately, we are not completely at sea without a compass, even in this mysterious realm. We can determine by adroitness if there have been attacks of vertigo, spasms, convulsions, or nausea, and whether there be any interference with muscular coordination in light or shade. The presence of arcus senilis in a marked degree may give us valuable information; motor or sensory disturbance may enlighten us; hemiplegia, paraplegia, or local paresis, such as ptosis, strabismus, convergent or divergent, paralysis or paresis of the muscles of the face, tongue, or pharynx, as manifested in expression, speech, deglutition, all come in as handmaids to help us in this dilemma. Local areas of hyper-

esthesia or anesthesia enlighten us; epilepsy, double vision, inequality of pupils or irregular dilatation, their response to light and shade, all give us valuable information.

If hearing be diminished, is the loss due to structural changes of the transmitting apparatus or to paralysis of the auditory nerve?

Finally, the operations of the mind and the mental condition afford us means of determining important facts. Is the applicant unusually sanguine? Has he an exhilaration of mind or an exalted view of life? How far does it tend toward hallucination, or, if it has passed beyond that stage, to mania? Is he self-accusative or melancholic?

To consider dementia in such a connection would be folly.

To determine the condition of the spinal cord and membranes has more especial interest and reference to the muscular actions, both voluntary and involuntary.

What about the breathing? Is it irregular in rhythm?

Is there sighing, dyspnea, or hiccough? The heart's action—slow or rapid; interference with deglutition or speech; paresis or paralysis of limbs, bowels, or bladder; movements in walking and quickly turning, and the extent of muscular tremor if it exist.

The state of the kidneys and the genito-urinary apparatus may be speedily determined by the usual analysis of the urine for albumen and sugar, its reaction and specific gravity, and corroborated by the appearance of the retina under ophthalmoscopic illumination. If the urine depart from the normal standard sufficiently far to require further examination, that fact alone is sufficient to render the risk of doubtful expediency.

The lymphatic system is of interest only as regards its involvement in syphilis, cancer, and tuberculosis.

There remain but two factors to complete a physical examination, and they have already been incidentally mentioned in connection with the nervous system. I refer to the special senses of sight and hearing.

Refractive errors, corrected with proper glasses, the sight should equal twenty snellen. Should it not be so, inspection

will reveal any abnormal conditions of the lids, conjunctivæ, corneæ, irides, and pupils; the ophthalmoscope likewise, of the mediæ and fundus of the eyes when the former are normal.

Any interference with hearing may be due to abnormalities of either the transmitting apparatus or perceptive apparatus of the ear. Differentiation, which is of the utmost importance, may be accomplished by the removal of inspissated cerumen, inspection of the drum membrane and the tuning-fork.

The integrity of these two special senses is of importance as affecting the ability of the applicant to avoid accidents.

When this has all been done properly, a physical examination may be said to be complete, and it may have been observed that it has all been done without the necessity of any questions to the applicant, except two, his age and social condition.

This physical examination having been completed, a stage is reached in which it may, or may not, be necessary to take the statement of the claimant on the matter of history, according to the intelligence with which the facts already brought out are viewed.

Five matters of antecedent history alone concern us as practical factors, and the means of reaching them afford the best test of an examiner's fitness for his position and of his utility to an insurance company.

They are: 1. Syphilis. 2. Rheumatism. 3. Suicide. 4. Consumption. 5. Habits.

As to Syphilis. If inspection has revealed no scars upon the skin or in the groins, no engorgement of the cervical or epitrochlear glands, no palmer syphilides or evidences of previous falling of the hair in the occipital region; if examination of the throat, nasal septum, and turbinates yields no information, we have still the retina as a fruitful field for exploration, for if syphilis has really been present in that system it can scarcely fail to have left its traces upon some of these organs, and if it have not, its grade of intensity has been too slight to be considerable, and time alone, perhaps, has eradicated it from the system. Finally, even if it has been present and shall have left

its artistic handiwork plainly stamped upon the system, it should in most cases, under a treatment sufficiently protective, constitute but a temporary bar to life insurance.

Of course there is syphilis and syphilis, the varieties of intensity probably depending more upon the susceptibility of different organizations to the virus and the circumstances surrounding the individual in whom it occurs.

It mostly manifests itself in depravities and aberrations of nutrition, and is seldom a disease of great gravity, especially among those who live under good hygienic conditions and able to procure good medical services, as do usually the classes of people who are able to purchase the commodity of life insurance.

When one has once had the misfortune to contract the pox, one should have it cured; and when by virtue of proper treatment he has returned to a normal condition, he has the right to aspire to life insurance the same as he has to marriage. But he has not the right to be passed for life insurance with a syphilis neglected or treated with a stupid indifference, or, in other words, by contempt. He has not the right to be passed until the responsive character of his system and his dyscrasia have been put to the crucial test of therapeutic intervention. Nor has he the right to be passed until he shall have been free even from the slightest manifestations of his infection for at least five years.

With Regard to Rheumatism. The condition of the joints, muscles, and tendons should be noted along with a recurrence to what has already been determined with regard to the heart. The number of attacks, as denoting a tendency to recurrence, is here of almost as much importance as the fact of its occurrence in the individual at all. The effect an attack has had upon joints, muscles, and tendons, the heart, the kidneys, and the vitreous humor, indicated by amblyopia and discernible with the ophthalmoscope, is quite as important a feature as the fact of an attack or a number of attacks. If but one attack has occurred, and that at a reasonably remote period, and no impression remains on any of the organs mentioned to alter either their structure or

their function, this factor may reasonably be cancelled from the equation and the case regarded as if it had never occurred; on the other hand, if more than one attack has occurred, even if no organic results are discernible, the risk is a dangerous one, because the next attack may wreck the most important, perhaps, of all organs, viz., the heart.

As to Suicide. After the examination of the nervous system, along with consideration of the mental operations, and the painstaking care that has characterized the examination into the question of syphilis, the examiner will be in possession of about all the facts determinable, except by direct interrogation of the applicant, whose statements in this regard are subject to verification at least from other sources of information.

What shall be said of the "bane of humanity, consumption?" The fact as to whether an individual has a history of consumption in his family is one which has always borne great weight in all medical certificates of examination, and it is particularly to a discussion of this question by this august assembly this paper has been designed to lead.

The assertion has been boldly made in this and other medical societies by gentlemen to whose opinions the leading members of the profession of the country have been accustomed to yield respectful reverence, that "adults do not die of inherited consumption." Upon the truth of this enunciation rests the possibility of most interesting discussion. If this be true, then does the family history of consumption merit the distinguished importance given to it in life insurance?

And Why? Why should any history be regarded in the cases of men who have been removed from the scenes of its occurrence for a period of time extending long beyond its period of incubation after infection, or is there any such period to be definitely set? Has scientific investigation placed any such period at our disposal upon which we can rely? These and other questions of the keenest interest must suggest themselves to both the medical practitioner and to those interested in life insurance as a business pursuit.

For the solution of these complex problems we are bound to look to the "free-lances," who are ready to let the light of science shine upon the obscure questions that perplex us.

Shall we beg the question or avoid it by saying that, while inherited tuberculosis is seldom or never observed in the adult, the predisposition to infection is? That the constitution assailable by tuberculous infection is inherited and passes along, the undesirable companion through life of the individual born of tuberculous parentage?

The problem then remains quite as unsolved as it was before, so far as the business proposition of life insurance is concerned. Habits as to use of alcoholic beverages, tobacco, and sedative drugs, and depressing vices are subjects to which attention now is usually carefully paid by companies themselves, and do not interest the examiner so much as formerly, because the information is secured through other channels; yet much may be suggested to the wide-awake examiner by the general appearance of the subject in the absence of syphilis, tuberculosis, or cancer.

In conclusion, it is only necessary to remark that it has been the writer's aim to impress the fact that an examination to be complete physically and medically can be so skillfully conducted, with the aid of the intelligent use of instruments of precision, such as the ophthalmoscope, nasal and aural specula, the tuning fork, laryngoscope, and rectal specula as to permit the examiner to present, regardless of the applicant's statements, such a description of the subject to the supreme or chief medical director of insurance companies as will enable him to answer with reasonable certainty, "Will the applicant or will he not live his life expectancy?"

If the intelligent use of these instruments has not been acquired by the examiner, the important points which most affect a risk may escape him, and thus the company he represents may be seriously crippled by either the loss of profitable business or by the premature loss of risks that should not have been recommended for acceptance.

FOREIGN BODIES IN THE APPENDIX.

By W. O. Roberts, M. D.
Louisville, Ky.

Foreign bodies, until recent years, were thought to be the chief factors in the causation of appendicitis. Now they are known to be present in a very small per cent of operative cases; in fact, the percentage is so small that many prominent surgeons, who have had very large experience in appendiceal surgery, have never met with a true foreign body.

While on a visit East this spring I took occasion to interview a number of surgeons as to their personal experience with foreign bodies in the appendix, with the following result:

Dr. W. W. Keen, of Philadelphia, no case.

Dr. Noble, of Philadelphia, no case.

Dr. W. T. Bull, of New York, no case.

Dr. Weiss, of New York, no case.

Dr. John A. Wyeth, of New York, no case.

Dr. McCosh, of New York, one case, a pin.

Dr. Hartley, four cases; two pins, one birdshot, and one orange or lemon seed.

Dr. Robert T. Morris, of New York, one case, a piece of apple-pip.

Dr. McBurney, "much less than one per cent."

Dr. Nicholas Senn, of Chicago, one case, a pin.

Dr. Murphy, of Chicago, "not one half of one per cent."

Dr. John Deaver, of Philadelphia, three cases; one pin and two shot.

Dr. P. Dandrige, of Cincinnati, one case, a piece of wire.

Of two hundred and fifty cases of appendicitis operated on during the last ten years at Johns Hopkins Hospital, a foreign

body, a section of tapeworm, was found in only one. (James F. Mitchell, Johns Hopkins Bulletin, January, 1899.)

According to Mattersock and Fowler, foreign bodies are found in only about four per cent of operative cases.

Renvers collected from the literature four hundred and fifty-nine autopsies on cases of appendicitis, in sixteen of which there were foreign bodies.

Fitz, in his series of one hundred and fifty-two cases, found them in twelve per cent.

Dr. James F. Mitchell collected fourteen hundred cases from various sources in the last ten years, with seven per cent of true foreign bodies.

Comparing the individual experience of the gentlemen referred to as having been interviewed by me with these statistics, one is inclined to believe that most likely some of the so-called foreign bodies included in these tables were really fecal concretions. Owing to the striking resemblance of fecal concretions to different forms of seeds, they might very readily be mistaken for them. Sometimes it requires a careful chemical examination to distinguish between fecal concretions and gall-stones.

Mitchell calls attention to an interesting case of Dr. W. L. Rogers, of Memphis, bearing on this point. His patient, a man twenty-two years old, had had an attack of hepatic colic, with intense pain in the region of the gall-bladder, jaundice, fever, etc. A few days after this trouble subsided, symptoms of appendicitis set up, and when the acuteness of the attack had disappeared three small nodules could be felt at the side of the appendix. The appendix was removed, and upon examination was found to contain three bodies looking exactly like gall-stones, and such they were thought to be until examined chemically by Dr. Brown, who found that they contained no cholesterin, no bile nor salts, but were composed mostly of organic matter, with carbonates and sulphates of calcium and magnesium.

Foreign bodies have frequently been met with in autopsies made upon persons who had died of other diseases, and who had

had no symptoms of appendicitis during life, and the appendix containing the foreign body showing no evidence of disease.

J. L. Mitchell, in his paper above referred to, quotes from Heveries Memoirs de l'Academie Royal de Chirurgie, 1743, the following: "One notices sometimes in opening the bodies of persons who during life have eaten a great deal of game there is collected in the intestines, and especially in the cecal appendix, a great quantity of shot, without these persons having had the least inconvenience."

Holmes (New England Quarterly Journal of Medicine and Surgery, 1892) reports a case in which there was found in the appendix of a man dead of pneumothorax one hundred and twenty-two robin shot. The man had had no symptoms referable to the appendix during life.

Warren Coleman, of New York (Press and Circular, August 21, 1895), in an autopsy found a bone five eighths of an inch in length and one fourth of an inch in circumference, which had extended blunt end foremost up to the extreme end of the appendix, completely filling its cavity. The bone was entirely surrounded by mucus, and there was no sign of inflammation within or without the appendix.

Foreign bodies have also been met with in the appendix when the abdomen had been opened for other causes, and the appendix in a healthy condition. Dr. McBurney found two grape seeds in a healthy appendix of a woman on whom he was operating for the removal of an abdominal tumor.

Such evidence goes to show that the appendix will tolerate the presence of a foreign body without symptoms so long as it does not produce injury to its structure, from which infective processes may take place.

When a foreign body once gets well into the cavity of the appendix it is very apt to remain there, owing to the weak expulsive force of the appendix, and, while it may not give rise to trouble immediately, it is almost certain to act as a nucleus for a concretion, which will in time cause some form of trauma;

consequently it is always wise when one is found accidentally to remove the appendix.

Seeds of various kinds, which were formerly thought to be so frequently met with, are now known to be very rare, fecal concretions having been mistaken for them. The form of foreign bodies most frequently met with are heavy bodies, such as shot and sharp-pointed bodies, as lumbricoid worms, bones, and pins.

Mitchell collected from the literature thirty-five cases in which pins were found. In two of these cases the appendix was found in a hernia sac, one being the case reported by me to the State Society in 1896, and the other a case operated on by McBurney in 1888: "Boy, ten years old, had had for some time what appeared to be an inflamed irreducible right inguinal hernia, the contents of which were thought to be omentum. At the operation the contents were found to be a much inflamed and thickened bulbous appendix, the enlarged distal end being half an inch in diameter. In this mass, the points piercing one side and the heads the other, were two black pins, which lay close together."

As Dr. Mitchell says, "one would naturally suppose such a foreign body as a pin in the appendix would lead to rapid perforation, but, while this is generally the case, it is not always so. All types of appendicitis may result. Some give rise to only mild symptoms, and may lead to chronic appendicitis, with recurrent attacks (such as was the case in seven of the cases he collected) or with long-continued pain or only a feeling of uneasiness in the right iliac fossa, which may last for months or years (two cases). Most often, however, there is rapid perforation—an abscess formation—following the first appearance of symptoms. The pin generally lies straight in the lumen, its long axis parallel to that of the appendix, and perforating with its point. In two instances it was crosswise, and perforated one wall of the appendix with its point and the other with its head. In the majority of instances where pins were found the patients were males, and in no instance did the patient remember having swallowed a pin."

A REPORT OF SEVEN CASES OF EMPYEMA, WITH TREATMENT.

By J. V. Prewitt, M. D.
West Point, Ky.

The object of this paper is to report in condensed form the main facts of seven cases of empyema, which required surgical interference for their relief, with results stated in each case.

Case 1. Edward M., white, age twenty-three years; called to see him February 22, 1891; found him suffering from chronic empyema, secondary to pneumonia. Dr. R. Tydings, being present, stated that he attended him since January 2d, when he was first taken with pneumonia; that on February 7th he recognized a pleural abscess pointing in axillary line on the right side about the eighth intercostal space, which he opened by small incision that closed shortly afterward. Upon examination I found him very much emaciated, coughing quite frequently, expectoration purulent in character, temperature 102.5° F., pulse 118, dyspnea well marked, dullness on the right side extending from base of lung to the fourth rib, chest bulging. The opening, which was made a few days previously, was completely closed. After taking all necessary antiseptic precautions, an opening two inches long was made in the seventh intercostal space just a little posterior to the axillary line; cavity irrigated with a one to ten thousand bichloride solution. Not having a rubber drainage-tube at hand, I used iodoform gauze for drainage. Irrigation was continued for a short time by his physician, and I lost sight of him until the 12th of June, when I was sent for by the patient. I found his condition to be any thing but encouraging. I found the opening closed that I had previously made, dyspnea intense, side bulging, edema of the right foot extending well up the limb,

night sweats, temperature 101° F., coughing, dullness from base of lung anteriorly and posteriorly to apex of the pleural cavity. Patient had become melancholy and wanted to die. Antiseptic precautions having been taken, chloroform was then cautiously administered; pleurotomy was performed in axillary line at sixth space, cavity flushed with a one to six hundred bichloride solution, one large drainage-tube inserted, dressed with iodoform gauze and borated cotton, adhesive straps being used to hold the dressing in position. It was irrigated every other day for eight days, then twice a week for a month, recovery resulting in five weeks.

CASE 2. On December 4, 1892, I was called to see Charles R., white, age twenty-seven; found him suffering with a right lobar pneumonitis; December 20th found circumscribed dullness, cough, dyspnea, pains, temperature 103° F., pulse 120. Aspirated with a hypodermic syringe and found pus. Pleurotomy was done in axillary line and sixth intercostal space, cavity flushed with saturated boric acid solution, inserted double drainage-tube, five irrigations being sufficient. Patient was discharged cured in one month.

CASE 3. March 24, 1893, I was called to see Mrs. J., white, age twenty-one years, who had been ill three weeks. She gave a history of primary pleurisy, right pleura involved; circumscribed dullness and slight bulging led me to aspirate with a hypodermic syringe. Pus was found. Pleurotomy performed in axillary line in seventh intercostal space, irrigation with saturated boric acid solution, double drainage-tube inserted. After third irrigation patient was discharged, recovery being uneventful.

CASE 4. Miss M., white, age fourteen, diagnosis empyema, secondary to pneumonia, right pleura; she was very much emaciated, coughed rather severely at times, diffused pain in right pectoral region, side bulging, dyspnea, temperature 99.5° F., pulse 120. Dr. A. B. Applegate, her physician, administered the anesthetic (chloroform). Pleurotomy was performed in

axillary line at seventh intercostal space, cavity flushed with boric acid solution, double drainage-tube inserted, and dressing applied. Her physician reported a good recovery seven weeks later.

CASE 5. Marion W., colored, age twenty-three. I was called October 12, 1897. Diagnosis empyema, secondary to tuberculosis; bulging in the right posterior thoracic wall. He was also suffering with pyemia, there being a number of abscesses scattered over a large portion of his body, a number of joints being involved. The abscesses were opened and drained. The case being a hopeless one, I did not attempt to do any thing further, as he could live but a short time, or a few days longer.

CASE 6. On August 18, 1898, I was called to see Luther H., colored, age twenty-six, duration of illness about two weeks. Diagnosis empyema, left thorax, secondary to pneumonia. Most prominent symptoms were cough, pain in left pectoral region; temperature 104° F., pulse 128; dull friction sounds could be heard slightly, chest bulging. His physician, Dr. Coleman, administered chloroform. Pleurotomy was performed, the opening being made in second intercostal space, directly above left nipple, cavity irrigated with boric acid solution, and drainage-tube inserted. Recovery resulted in four weeks.

CASE 7. On November 23, 1898, I was called to see Lee G., age nineteen years, white. Diagnosis empyema, right pleura, secondary to pneumonia. Character of effusion recognized by hypodermic syringe. Pleurotomy was performed in axillary line at sixth intercostal space, irrigated with boric acid solution, and double drainage-tube inserted. Recovery resulted.

COMPLICATIONS ATTENDING RHEUMATIC FEVER, WITH HISTORY OF CASE.

By Hugh L. McLean, M. D.
Wilmore, Ky.

In presenting this paper before you I have nothing new to offer in the way of treatment, but hope to profit by the expression of your opinions and your methods of handling the attending complications.

Patient, male, aged forty-one, occupation teacher. No history of rheumatism in any other member of his family. Had a severe attack of rheumatism in his twenty-first year while attending college, which confined him to his bed for six weeks. He also reported two attacks, of four weeks each, some years previous, but of these nothing definite could be learned. I was called to see patient March 14, 1899. Temperature 101.8° F.; pulse 110; respirations normal; tongue covered with a white fur; bowels constipated, right knee swollen and very painful. He had been suffering from this joint for three or four days, but had continued to perform his daily duties.

Urine highly acid; specific gravity 1016, trace of albumen; passing from 35 to 40 ounces daily. The salicylates were given in full doses, and he was put on milk diet exclusively and lithia water. Hot applications were applied to the affected joint, and mercury in small and oft-repeated doses given to relieve constipation.

The following day the left knee was involved. Temperature 103° F.; pulse 110; respirations normal. The same treatment was continued with the addition of mur. morphina and salol to relieve pain and produce rest. Hot alkaline baths followed by light and rapid friction were given daily. They were very grateful to the patient, reducing the temperature and producing sleep.

March 19th, five days after first treatment instituted, temperature 99°; pulse 82; respirations normal; patient walking around the room; swelling in joints almost entirely disappeared, but some nausea after taking salicylates. Iron was given in full doses while temperature remained below 100° F.

The following night a severe arthritis set up in right foot. Temperature 103° F.; pulse 100; respirations normal. Salicylates were withdrawn, and antipyrine and salol were given, and produced a very happy effect in controlling pain and temperature without any perceptible cardiac depression.

March 21st. Patient passed a very restless night. Complained of pain in the pericardial region and sense of constriction over the whole chest, with considerable dyspnea, especially after change of position or any slight exertion. Pain extending down left arm, and left hand swollen. Temperature 103° F.; pulse 100, full and strong; respirations 44. Pericarditis with effusion was diagnosed. The following day the right hand was swollen and very painful. The effusion increased in the pericardium. The patient was kept perfectly quiet, and every one excluded from the sick-room except those in direct attendance. Respirations increased to 60 per minute; temperature 100° F.; pulse 110. The anti-rheumatic treatment was continued. Patient was very restless, mild delirium, but not constant. Urine still highly acid, specific gravity 1020, passing from 38 to 44 ounces daily, slightly albuminous.

Nitro-glycerine and digitalis each $\frac{1}{100}$ and strychnia $\frac{1}{60}$ of a grain were given every three hours. By this the heart's action was rendered more regular and reduced in frequency.

Respirations increased in frequency, flatness at base of left lung and dullness extending as high as second costal cartilage, absence of vesicular murmur over this portion of the lung.

March 25th. Temperature 103° F.; pulse 98; respirations 75; joint inflammation subsiding. Consultation was called, but aspiration of pleura or pericardium was not deemed justifiable.

The arthritis continued to improve, and by the fifteenth day of the rheumatic fever all symptoms of the rheumarthritis had disappeared.

Temperature remained high; pulse 98; respirations 84. Oxygen was ordered for the relief of the dyspnea.

At this point all medicine was suspended, and physician and nurse discharged, divine aid being relied upon. The patient remained in this condition for sixteen hours, when the physician was recalled and asked to resume the case. Found patient very nervous, muttering delirium. Temperature 103.5° F.; pulse 120; respirations 86. Oxygen was given at once, and heart stimulants resumed, the oxygen giving deeper respirations and reducing their frequency, and the patient resting quietly after each administration. The pericardial effusion commenced to subside and the lung to resume its normal position, with the natural result of deeper and freer respirations.

Temperature continued at 103.5° F.; pulse 120; respirations 30, until April 1st, when the heart suddenly weakened, and death ensued the twentieth day of the rheumatic fever and the twelfth of the acute pericarditis.

In the treatment of rheumatic fever innumerable remedies have been brought before the profession as specifics, but the results, as a rule, have been disappointing, and it still remains one of the most unmanageable of all diseases.

Finding and removing the probable cause of the disease is a very important step in the way of treatment. That the salicylates have a controlling influence over the course of the disease is questioned, although the favorable results obtained from their use at the beginning of the attack—temperature being lowered and joint inflammation subsiding—is gratifying, and in a certain class of cases of the milder type recovery sometimes follows.

In the severe forms relapses are almost certain to follow their employment, and we find our patient in a weak and debilitated condition with an irritable stomach and the course of the disease not shortened.

The frequent occurrence of endo- and peri-carditis should keep us on the alert in the treatment of these complications, and in the case reported pleurisy with effusion played an important part.

The hygienic surroundings should be as nearly perfect as possible. The temperature of the room should be from 65° to 70° F., and all draughts avoided. The clothing ought not to be so heavy as to favor perspiration. Stimulants are rarely indicated; a light diet, preferably milk, is safest, especially during the acute stage.

We had in the case reported the rare complication of "faith cure" (I say complication advisedly, for those of you with whom it has come in contact, when it fully ignores medical science, must regard it as a troublesome factor in the treatment of disease).

Whether or not it hastens the fatal termination, the observations in one case are not sufficient to determine. The heart's action was weakened, and it never regained any of its lost vitality when treatment was resumed. How best to meet this, as well as other complications, and do our whole duty to our patient as well as ourselves, I kindly ask your thoughtful consideration.

KENTUCKY STATE MEDICAL SOCIETY.

MINUTES OF THE FORTY-FOURTH ANNUAL MEETING, HELD AT LOUISVILLE, MAY 17, 18, AND 19, 1899.

FIRST DAY—*Morning Session.*

The meeting was called to order in Liederkranz Hall, Louisville, May 17th, at 11 A. M., by the President, David Barrow, M. D., of Lexington. The session was formally opened by prayer by the Rev. C. R. Hemphill, D. D., of Louisville.

Dr. Urban V. Williams, of Frankfort, presented a gavel with an appropriate speech. The President thanked Dr. Williams in behalf of the Society.

The address of welcome was delivered by Dr. T. L. McDermott, of Louisville, and was responded to by Dr. Chas. H. Todd, of Owensboro.

REPORT OF THE COMMITTEE OF ARRANGEMENTS.

John G. Cecil, M. D., Chairman.

The Committee of Arrangements begs leave to report very briefly that the meetings of this Society will all be held in this hall. The afternoon session to-day will begin at 2:30 o'clock. This evening at 8:30, in this hall, will be delivered the President's address, to be followed shortly by an address by the Rev. Carter Helm Jones, the pastor of the Broadway Baptist Church of this city.

We have frowned upon all private entertainments of social character, and every thing else which would serve in any way to detract from the scientific proceedings of this Society. We trust the members of the Society will spend their time in this hall. We want all the interest to be centered here.

The report of the Treasurer was postponed.

THE REPORT OF THE SECRETARY.

Mr. President and Gentlemen:

Like wine, the Kentucky State Medical Society improves with age. It gives your Secretary very much pleasure to assure you that in this, the Forty-fourth annual session, we are as numerous and in as strong bodily vigor, as substantial and as influential, probably more so, than in any previous period of our history. Our condition is not only bright, but our anticipations are brighter. The large attendance on this occasion, composed of all round, intelligent, educated practitioners, and with a program of your own invention, laden with contributions, certainly shows an infinity of interest. Worthy and well qualified, you hold a large place in the public expectation. Father Time, too, has dealt leniently with us since our last meeting; yet we must deeply deplore the demise of seven worthy members, who were markedly devoted to the best interests of this Society, and who not only adorned the ranks of medicine, but held places of distinction among their fellows, namely, R. L. Agnew, of Sebree; Jerman M. Baker, Shelbyville; John A. Larrabee, Louisville; J. M. Foster, Richmond; W. E. Fowlkes, Owensboro; George Perkins, Somerset; A. M. Miller, Harvieland. The number of permanent members now on the rolls is 445. Before another year it is likely that a number, who are as barnacles on a ship, perforce must be eliminated for non-payment of dues. The number that have asked to have their names stricken from the roster is five, whose dues are paid in full, namely, W. W. Cleaver, Lebanon; L. D. Knott, Lebanon; John E. Pack, Georgetown; H. B. Ritter, Louisville; George M. Warner, Louisville.

We have had recently a communication from the Secretary of the American Medical Association, in which he asks if there is a way by which this Society can place on the list, as recognized by representation, delegates from district and county medical associations, which are scattered all over our Commonwealth, and who desire to go as delegates to the National body. He wishes that such changes may be made in our laws that all our local societies may be recognized. It is true that some of our "locals" are, and have been, recognized for a long time, notably the Central Kentucky Medical Association, and why not all of them?

Very respectfully,

STEELE BAILEY,

Permanent Secretary.

Report of the Committee on Publication.

Dr. Henry E. Tuley, Louisville:

The Committee on Publication has simply to report, as is indicated in the preface of the minutes, that

"The Committee on Publication has deemed it best to issue only the minutes of the last meeting.

"Attention is particularly called to pages 20 to 23, inclusive, relating to the proposed change in the Constitution.

"According to the By-Laws this will be finally acted upon at the next meeting."

The state of the treasury did not permit the issuing of a volume last year.

A telegram of greeting and good-will from the Pennsylvania State Medical Society, in session at Johnstown, Pennsylvania, was read by the Secretary and received with applause. It was directed that a response similar in sentiment be returned by the Secretary.

The report of the Board of Censors was deferred, since there were only three of the members of the Board present.

Report of the Committee on Constitution and By-Laws.

Dr. Henry E. Tuley, Louisville:

Mr. President, a change proposed at the last meeting of the Association, in regard to amending the Constitution, was referred to this meeting for final action. According to the law of the Association, the amendment will have to be read at each morning session and finally voted upon on the last day. With your indulgence, I will read the committee's report handed in at the Maysville meeting:

Resolved, That the following changes be made:

Article III.

MEMBERSHIP.

Section 1. The members of this Society shall consist of delegates from the various county medical societies of this State, organized in accordance with the provisions of this Constitution, who shall serve one year or until others are elected to succeed them.

Sec. 2. All members in good standing in the auxiliary county societies shall be members of this Society, with all its rights and privileges, except that none but delegate members shall transact the legislative business of the sessions.

Article IV.

Section 1. Any incorporated county medical society whose constitution embraces the objects of this Constitution and the Code of Ethics of the American Medical Association, shall, upon application, become auxiliary to the State Society, and shall be entitled to one delegate for every five members, and one for every additional fraction of more than one half of that number.

Sec. 2. The names of members of such county societies, with their post-office addresses, shall be certified by their respective secretaries and forwarded to the Secretary of the State Society, who shall enroll them in a book kept for this purpose, and each member shall be entitled to a copy of all the publications of this Society upon the payments of its assessment.

Sec. 3. Every county society shall, at least thirty days before the annual meeting of this Society, make a full and correct catalogue of its members in good standing at the time, and transmit the same at once to the Secretary of this Society. If the name of a member is omitted from this catalogue that was contained in the last preceding catalogue, the County Society must explain the omission by stating whether the member whose name is omitted is dead, has withdrawn, has been expelled, suspended, or whatever is the fact; and no one not a member in good standing in his county society can be a member of this Society. Where a member of an auxiliary society has had any right of membership abolished or abridged on account of non-payment of a pecuniary obligation to such society, such member shall be restored to all the rights thus abolished or abridged by the payment of such obligation at any time before such society makes its next annual report to this Society, and such member may be restored at any time thereafter on a majority vote of such society and the payment of such obligation.

Sec. 4. All assessments of money made by this Society shall be per capita on all the members of all the county societies, and each county society shall collect the assessments on its members and forward the same to the Secretary of this Society within the time named;

and any county society that fails to comply with this requirement shall be held to be in contempt, and none of its members shall be allowed to participate in the business of this Society until such county society shall have purged itself of the contempt.

Sec. 5. The annual assessment on each member of the county society for the use of this Society shall be one dollar, which shall be forwarded to the Secretary of this Society with the annual catalogue of members, as provided in Section 3 hereof.

Sec. 6. The delegates to this Society shall be appointed by the county society at the time the county societies are required to make this annual catalogue of members, and the names of the delegates, one of whom shall be designated to act as a member of the Nominating Committee to be appointed at the next meeting of the Society, shall be forwarded to the Secretary of this Society as soon as they are appointed.

Regarding the appointment of delegates to the American Medical Association, hereafter the several county societies shall be required, at the time of appointing their delegates to this Society, to nominate and forward to the Secretary of this Society the names of the delegates to the American Medical Association, the number of such nominations to be governed by the rules of said Association, and all the nominations for such delegates shall be confirmed by this Society, which shall have the power to fill all vacancies and supply all omissions of the county auxiliaries.

The names of all the delegates to the American Medical Association appointed by the different county societies must be sent to the Secretary of the State Medical Society at least thirty days, with report of delegates, etc., before the yearly meeting of said Society.

No voluntary paper shall be read before this Society, or printed in the Transactions, unless such paper shall have been read before the Society of the county in which the author lives, and by such county society referred to this Society; and no papor so referred shall occupy more than twenty minutes of time in its reading.

No paper which is presented to this Society and is referred to the Committee on Publication shall be allowed to appear in print before the publication of the Transactions without the consent of the Committee on Publication.

Sec. 7. The scientific communications of this Society shall consist of such papers as the county societies may order to be presented here, and the report of such special committees as may be appointed

to write on selected subjects and voluntary papers. All such papers shall be sent to the Chairman of the Committee of Arrangements at least twenty days before the annual meeting of this Society.

Sec. 8. The Committee of Arrangements shall examine all the papers submitted to them under the provisions of Section 7, and determine the order in which they shall be presented to the Society. The Committee of Arrangements shall have printed a programme of business for the use of members at each annual meeting.

Sec. 9. Any county society desiring to become auxiliary to this Society may file a certificate of its compliance with the condition of Article III of the Constitution, and the Secretary of this Society shall judge of the sufficiency of such certificate until the next meeting of this Society.

The Secretary is instructed to restore all county societies which have been regularly admitted into the State Society, and whose names have not appeared in the last volume of the Society's Transactions, to the roll of County Auxiliary Societies in the forthcoming Transactions of the Society. When any county society shall fail to send a delegate to the annual meetings of the State Society, it shall be the duty of the Secretary to open correspondence with such Society and use his best influence to induce it to assume and exercise its normal functions and relations to the parent body, such service not to transcend the finances of the Society to compensate for the same, and report at the succeeding annual meeting the result of his labors in this direction, in order to maintain the integrity and prosperity of the Society.

The President: This report contemplates a change in the Constitution, and consequently has to be read to-morrow and the following day, and all the discussion in regard to the report will take place Friday morning.

Applications for membership were deferred until later, since through a misunderstanding with the Express Company the box of books and papers belonging to the Secretary had not yet been received at the hall.

Attention was called to the omission in the programme of the Committee on Necrology, of which Dr. J. H. Letcher, of Henderson, was Chairman, and the President called for that report.

Report of Committee on Necrology.

As Chairman of your Committee on Necrology it becomes my sad duty to report the death of six of our members occurring during the past year. They were all good men and true, and though having oftentimes been instrumental in warding off disease, suffering, and even death itself in their fellow-men, bringing to many homes beauty for ashes, have at last had themselves to succumb to the relentless foe, death.

Dr. John Milton Foster.

The first break in our ranks came with the death of Dr. John Milton Foster, who was the son of the late Dr. Thomas W. Foster, of Lexington. The latter was a prominent physician in Kentucky for forty years. John M. was born in Keene, Ky., April 6, 1856, and died in Richmond, June 3, 1898.

He attended school in Lexington, graduating from the old Transylvania (now Kentucky) University. Studying medicine with his father as preceptor, he spent two years at college, in Louisville, and then went to New York, matriculating at the College of Physicians and Surgeons, where he received the degree of Doctor of Medicine in 1881. He at once entered Bellevue Hospital as interne, and after service there was for nearly a year surgeon on an Alexandrian Line ocean steamship plying between New York and Vera Cruz. He then returned to Kentucky and located at Richmond in 1884.

In 1887 he married Miss Elizabeth Duncan White, only daughter of Col. Richard White, of Richmond, State Senator from that district. Having an inborn fondness for his chosen vocation, and being an industrious and earnest student, he soon became a skillful physician and surgeon, doing a lucrative and growing practice, and being highly esteemed, not only by his clientele but by all who knew him. His devotion to his profession prompted him to take several post-graduate courses in New York and other medical centers, going in 1894 to Berlin, where he spent several months in the study of surgery alone. The field of surgery was especially attractive to him, and the last years of his life were devoted almost exclusively to that department of our profession. Dr. Foster contributed some valuable articles to medical literature, and was a faithful member of this Society. Those of us who enjoyed his genial presence at our last year's meeting little dreamed that the then robust, healthy-looking, happy man would in less than one month be in death's cold embrace. He was one of the

founders and continued supporters of the Pattie Clay Infirmary, a zealous member of the Century (Literary) Club of Richmond, and above all a consistent member of and office-bearer in the Christian Church. He was an affectionate husband and father. His wife and three children survive him. The Madison County Medical Society and other organizations passed suitable resolutions expressive of their regret at the loss of Dr. Foster. He died with the harness on suddenly in his office, when alone, of what was said to have been either heart disease or apoplexy.

Dr. John Albert Larrabee.

Dr. John Albert Larrabee, of Louisville, was last year, as this, my associate on this Necrological Committee. As his hands were full of work and health not good, at his request I made last year's report of eight deaths—three of whom were ex-Presidents of this Society.

I little expected the sad duty would be mine, at this meeting, to inform you that my confrere in this work had joined the silent majority. The facts here reported are from a sketch of Dr. Larrabee by his friend, Dr. Philip F. Barbour, of Louisville:

Dr. John Albert Larrabee was born at Gorham, Maine, fifty-nine years ago to-day, May 17th, and does it not seem appropriate for us to hold our first session after his death on his birthday anniversary? He suffered from rheumatic gout with cardiac and kidney complications, and died at his home in Louisville, June 12, 1898. Dr. Larrabee graduated from the literary and medical departments, receiving first honors in the latter, of Bowdoin College, Brunswick, Maine. He was in the Federal army during our war of '61–5, and whilst on duty in Louisville during the latter year was marrird to Miss Harriet Winslow Bulkley. He became a member of this, the State Medical Society, in 1868, and was elected its Secretary in 1872 and 1873, and its Treasurer in 1874. Being his successor in the Secretary's office, we were in our official capacity thrown often together, and it was then that I learned to know and admire him. He always took a deep interest in the Society, seldom missing any of its meetings, taking part in the discussion of subjects presented, and contributing many excellent papers. It was in this Society, April 5, 1877, that he presented a resolution asking the United States Congress to repeal the duty on quinine. His efforts, furthered by this and the American Medical Association, were successful, and a bill introduced by Congressman James McKenzie, of the Second District, became a law in 1877.

He was a charter member and ex-President of the Louisville Medico-Chirurgical Society, took an active interest in the American Medical Association, and was twice its Chairman of the Section on Pediatrics.

At the organization of the Medical Department of the Central University of Kentucky, in 1874, he was chosen Professor of Materia Medica and Therapeutics, and Clinical Lecturer on Diseases of Children. He occupied this position for sixteen years, when he became Professor of the Principles and Practice of Medicine and Clinical Lecturer on Diseases of Children, and in 1892 was elected President of the Faculty and Professor of Obstetrics and Diseases of Children, which position he was ably filling at the time of his death. He was considered a gifted lecturer, an excellent teacher, and was highly esteemed by his pupils. Dr. Larrabee was a conscientious, painstaking, and successful physician, bringing cheer and sunlight into the sick-room; was of a social, happy disposition, devoted to children, and they in turn loved him. Through his efforts was the Children's Free Hospital of Louisville founded, and in every public movement for the benefit of children he took a lively interest.

He lived and died a member of the Presbyterian Church.

Dr. W. E. Fowlkes.

Dr. Fowlkes was born on a farm in Henderson County, Ky., in December, 1850. After attending the schools at home and at Calhoun, he began the study of medicine at the latter place with his brother-in-law, Dr. Austin F. Watkins. He graduated in the Medical Department of the "University of Louisville," Ky., in 1873, and began practice in connection with the late Dr. Thos. J. Todd, of Curdsville, where he continued until 1879, when he moved to Calhoun, and thence to Owensboro in 1891. In 1889–90 he attended the College of Physicians and Surgeons, New York. Dr. Fowlkes died of typhoid fever and overwork at his home in Owensboro, February 25, 1898.

He married Miss Lottie Little, January 18, 1877, and she and four children, three boys and a girl, survive him.

Dr. Jerman M. Baker.

Dr. Jerman M. Baker was born in Cumberland County, Va., April 11, 1809, and died of apoplexy in Shelbyville, February 19, 1899. He practiced medicine for nearly sixty-seven years, held

membership in this Society for a long while, having been elected its President in 1875. He was elected the first President of his County (Shelby) Medical Society, and was a member of the American Medical Association. Both his father and paternal grandfather were prominent lawyers in Virginia. His mother (Miss Bolling) was a niece of Mrs. Thomas Jefferson, and one of his uncles, Hon. John W. Epps, was a son-in-law of Mr. Thomas Jefferson. Dr. Baker's medical preceptor was Dr. Robley Dunglison, and his Alma Mater the University of Virginia, where he received his M. D. degree in 1829. He practiced medicine in Davidson County, Tenn., for several years, coming to Shelby County, Ky., in 1842, where he continued his life-work as a doctor until about a year and a half ago.

He married Miss Mary J. Reed, of Nashville, Tenn., in 1834. Though doing a large practice, he was ever ready to respond to the call of the sick poor.

He was a member of the Episcopal Church, and senior warden to St. John's Parish. Dr. Baker did not strive for wealth or distinction, but preferred—

> "The peaceful night, the self-approving day,
> Unsullied fame and conscience ever gay."

Am indebted to an obituary of Dr. Baker by Dr. T. B. Greenley, of Meadow Lawn.

Dr. Robert Lee Agnew.

It is impossible within the compass of a few lines to write all one would wish to say concerning the admirable traits of character of a man so noble as was Dr. Robert Lee Agnew.

Having been his preceptor, and during his entire professional career meeting him often in consultation, I knew him well. Robert Lee, the son of R. Walter and Mary Agnew, was born in Henderson County, Ky., January 23, 1863. He received the degree of M. D. with honors from the University of Louisville, March, 1884, and at once began the practice of medicine at Sebree, where he continued actively his chosen vocation until his death of cerebro-spinal meningitis after only fifty hours' illness, February 26, 1899.

On the 2d of April, 1884, he married Miss Bettie Smith, of Henderson County, and she, with two children, are left to mourn his untimely death. Dr. Agnew was a true and affectionate husband, a devoted father, a dutiful son, a loving brother, and courteous, upright, and faithful friend. He was a member of the orders of Knights of Pythias and Masons, and in 1895 was elected Grand Chancellor of

the State of Kentucky by the former organization, making a most efficient officer. He was a man of fine personal appearance, and as a speaker possessed an easy, natural style, with but a simple choice diction, and soon won the rapt attention of any assembly before whom he appeared. If he had turned his attention to law he would doubtless have made a great reputation. Born a gentleman, he never, in spirit or letter, violated the code of medical ethics.

He was an honorable, progressive, up-to-date doctor, and his urbane and kind manners quickly won for him the confidence and love of his patients. To the sick poor he cheerfully rendered gratis professional services, and his unostentatious charities were bestowed with an open hand. As a citizen he was public spirited, taking a deep interest in every movement for the welfare of his city, and as an evidence of the esteem in which he was held, he was at the time of his death Mayor of Sebree. It is said that never in the history of Sebree has there a death occurred that caused such wide-felt, profound sorrow. Among Dr. Agnew's last expressions on earth were words of admonition to his little son.

"He rests well;
The good Knight sleeps where the daises nod,
And the clover hangs its head,
Where the wild bird comes, and the wild bee hums
Above his lonely bed.
He fought the fight—he kept the faith,
His fame shines bright and clear,
And his memory lives in loving hearts
Which will hold it ever dear—
The good Knight sleeps."

Dr. George Perkins.

Dr. George Perkins was born in the fall of 1843, in Somerset, and there received most of his education. He was always fond of books, and was a boy of a good deal of originality. His life was clean. He hated a mean thing, and it was next to impossible for him to be dishonest or false. Like his father before him, he was held in universal esteem. He possessed great courage as a man and as a physician, and was considered one of the best doctors in that part of the State. About thirty years ago he married Miss Safronia Vickory, of Somerset, Ky.; to them two daughters were born, both of whom are married. They and his wife survive him.

Dr. Perkins graduated in medicine in New York. His father enabled him to enjoy many medical advantages, and he improved them

all. He took great pride and pleasure in learning every thing possible about his profession, and his judgment had great weight with all who knew him. He was a faithful husband, a kind father, a good citizen, a large-hearted, broad-minded, charitable man.

He died May 11, 1899, at Somerset, Ky., where he had always lived, and where he was buried.

And now, as we thus do honor to the memory of our departed confreres who have fallen battling to save the lives of others, may we be reminded that we, too, must lay down our armor, some of us almost without a doubt before our next annual session.

Then, whilst here, let us follow closely in the footsteps of our noble Exemplar, the Great Physician, and—

> "Do noble things, not dream them all day long!
> And so make life and death and that vast forever,
> One grand, sweet song,"

JAMES H. LETCHER.

On motion, the Society adjourned until 2:30 P. M.

FIRST DAY—*Afternoon Session.*

In a special discussion of cerebro-spinal meningitis, the following papers were read:

"Cerebro-Spinal Meningitis," by James H. Letcher, M. D., Henderson.

"Cerebro-Spinal Meningitis in Henderson County," by D. O. Hancock, M. D., Henderson.

"The Etiology, Forms, Diagnosis, Prognosis, Treatment," by T. D. Williams, M. D., Bardstown.

"Treatment by Anti-Streptococcic Serum," by J. D. Maddox, M. D., Rockport.

"A Case of Cerebro-Spinal Meningitis," by L. C. Royster, M. D., Smith's Mills.

The discussion of cerebro-spinal meningitis was led by J. B. Marvin, M. D., of Louisville, followed by Dr. John A. Lewis, Georgetown; Dr. Archibald Dixon, Henderson; Dr. William Bailey, Louisville; Dr. J. O. Jenkins, Newport; Dr. F. J. Yager, Campbellsburg; Dr. J. W. Irwin, Louisville; Dr. Andrew Sargent, Hopkinsville; Dr. Cherry, Morgantown; Dr.

J. C. Sharp, Jeffersonville; Dr. J. G. Brooks, Paducah; Dr. Gossett, Dr. L. L. Solomon, Louisville; Dr. R. M. Jones, Louisville; Dr. C. C. Lewis, Stamping Ground; and in closing by Dr. D. O. Hancock, Henderson, Dr. J. D. Maddox, Rockport, and Dr. Royster.

Dr. R. C. Falconer, of Lexington, read a paper on "Gall-Stones."

Dr. Ap Morgan Vance, of Louisville, read a paper on "Charlatanism."

Discussed by Dr. B. W. Smock, Louisville, and Dr. Dudley S. Reynolds, Louisville.

On motion, the Society adjourned until 8:30 P. M.

FIRST DAY—*Evening Session.*

The Society reassembled at 8:40 P. M., and was called to order by John G. Cecil, M. D., Chairman of the Committee of Arrangements. He introduced Dr. David Barrow, of Lexington, President of the Society, who delivered the annual address.

The President at the conclusion of his paper introduced Rev. Carter Helm Jones, of Louisville, who delivered the popular address.

On motion, the Society adjourned until 9:30 A. M.

SECOND DAY—*Morning Session.*

The Society assembled at 9:30 A. M., and was called to order by the President.

MISCELLANEOUS BUSINESS.

The proposed change in the Constitution was re-read by Dr. Tuley.

The Treasurer's report was read:

To the President and Gentlemen of the Kentucky State Medical Society:

Your Treasurer takes pleasure in submitting his report, and in doing so he desires to call the attention of the membership to that

which has been referred to by the Treasurer every year to a greater or less degree, namely, that quite a number of our members are carelessly allowing their dues to accumulate from year to year, when the Society needs the money. A very few members have refused to pay their dues for 1898, on account of not having received a volume of the Transactions for that year. If all the members would attend promptly to the settlement of their dues the Committee on Publication would not be compelled to report adversely to issuing a volume for any year's meeting.

It would seem to me that our most excellent Secretary could attend better than any one else to the collection of dues during the year, and I most heartily concur with my predecessor in office in his suggestion that the Nominating Committee should take the matter under consideration of combining the offices of secretary and treasurer; Dr. Bailey practically has the work to do any way.

Our statement follows:

RECEIPTS.

Received of ex-Treasurer, Dr. J. B. Kinnaird,	$14 15	
Received of Dr. Steele Bailey, Secretary,	432 20	
Received of dues since Maysville meeting, collected by Treasurer,	333 00	
		$779 35

DISBURSEMENTS.

John P. Morton & Company, on account,	$479 40	
Wm. Whitford, stenographic report,	100 80	
Dr. Steele Bailey, Secretary, salary,	100 00	
Paid by Dr. Bailey individually, for expenses incurred in 1898,	25 00	
Stationery, printing, and postage, for Secretary,	17 50	
Stamps for notices of 1898 dues, for Secretary,	8 50	
Stamps for mailing programmes 1899, for Secretary,	6 00	
Expressage, telegrams, etc., for Secretary,	3 56	
Stationery, printing, and postage, for Treasurer,	10 00	
Revenue stamps, for Treasurer's drafts,	3 44	
Collection of drafts,	5 00	
		$759 20
Balance in treasury,		$20 15

Respectfully submitted,

CHAS. W. AITKIN, *Treasurer.*

Dr. Tuley moved that the report be received and filed, and that the recommendation contained in the report be referred to the Nominating Committee. The motion was seconded and carried.

Dr. C. B. Graham, Henderson: Mr. President, I have a resolution here, passed by the Henderson County Medical Society at the last meeting, that we would like the State Society to endorse. I would like to read the resolution:

Called meeting of the Henderson County Medical Society, May 15, 1899. The following resolution, made by Dr. Dixon, and seconded by Dr. J. C. Moseley, was passed by unanimous vote of the members of the Society present:

"*Resolved*, By the Henderson County Medical Society, that we endorse the action taken by the Boards of Health of the county and city of Henderson. That we think the action taken by the Fiscal Court of Henderson County was grossly unfair to the State Board of Health, to the County Board of Health, and to the City Board of Health. That it is the sense of this Society that no reputable physician in the county or city of Henderson can, without lowering his professional dignity and that of the medical profession, afford to work for the Fiscal Court of Henderson County in the present smallpox epidemic."

CYRUS GRAHAM, M. D., *Secretary*.

Mr. President, the reason for this resolution is this: We have had smallpox in Henderson County, which was taken charge of by the County Board of Health and the City Board of Health, who had it under control and agreed to pay a certain sum for the services of the physician who had charge of it. The Fiscal Court met and cut his salary in two. The County and City Boards of Health were characterized as thieves and robbers. Mr. Chairman, we have the best society outside the metropolis of the State of Kentucky. We have the society which is the home of the genial and intricate Dixon, the shrewd Letcher, and it was the home of him who has passed on before, the noble Thompson, and we have passed this resolution. Every member of the County and City Boards of Health resigned and left the epidemic in charge of the Fiscal Court, and we ask the Kentucky State Medical Society to endorse this resolution. We do not propose to be considered thieves and robbers, but gentlemen, equal to any in this or any other country. We ask you to endorse this resolution because we have endorsed it in our county

society, and the members of that society have informed the Judge that they would attend smallpox patients for nothing before they would work for the Fiscal Court.

Dr. McCormack: This is the same controversy that exists in half the counties of Kentucky where the courts have undertaken to take the management of smallpox out of the hands of the Boards of Health. These gentlemen are entitled to endorsement, and they are much more unfortunate than in my county, or this county, or in Fayette County. I move you, sir, that we endorse the resolution by a rising vote.

The motion was seconded by several, and the vote was unanimous.

"Is Infection and Putrefaction the Genesis of Micro-Organisms?" was read by Dr. Urban V. Williams, of Frankfort. The paper was discussed by Dr. Graham, and by Dr. Williams in closing.

On motion, Dr. Runyon, of Tennessee, and Dr. Bonifield, of Cincinnati, were invited to seats on the platform and to participate in the proceedings of the Society.

"Peculiarities in Heart Affections in Childhood" was read by Philip F. Barbour, M. D., of Louisville.

Dr. J. B. Bullitt, Louisville, opened the special discussion on "Normal Salt Solutions in Surgery" with a paper on that subject.

The discussion was led by Dr. August Schachner, of Louisville, followed by Dr. John A. Lewis, of Georgetown, Dr. Arthur McCormack, of Bowling Green, Dr. J. H. Letcher, of Henderson, Dr. W. C. Dugan, of Louisville, Dr. W. B. Gossett, of Louisville, Dr. C. L. Bonifield, of Cincinnati, Dr. R. C. McChord, of Lebanon, Dr. Taylor, of Greensboro, Dr. Edward Speidel, of Louisville, Dr. F. J. Yager, of Campbellsburg, Dr. B. F. Parrish, of Midway, and by Dr. Bullitt in closing.

Dr. August Schachner, of Louisville, read a paper on "Peritonitis from a Clinical Standpoint."

Dr. Arthur T. McCormack, of Bowling Green, read a paper on "The Closure of the Abdominal Wound after Laparotomy," which was discussed by Dr. W. H. Wathen, of Louisville.

Dr. Dudley S. Reynolds, of Louisville, read a paper on "Detachment of the Retina."

Dr. J. A. Stucky, of Lexington, read a paper on "Mastoid Operation, with Report of Case."

Dr. William B. Pusey, of Louisville, read a paper on "A Report of Two Hundred and Seventy-six Intubations."

Dr. Curran Pope, of Louisville, read a paper on "What Can We Do for the Chronic Invalid?"

Dr. F. H. Clarke, of Lexington, read a paper on "Friedreich's Ataxia, with Report of two Cases."

On motion, the Society adjourned until 2:00 P. M.

SECOND DAY—*Afternoon Session.*

The Society was called to order at 2:15 P. M. with the President in the chair.

Dr. Walker B. Gossett, of Louisville, read a paper on "The Use of Chloroform in Labor."

This paper was discussed by Dr. Lewis, Dr. Taylor, Dr. Thornton, Dr. Snyder, Dr. Austin, and in closing by the essayist.

Dr. R. R. Sullivan, of Uniontown, read a paper on "Treat Patient, not Disease."

Dr. A. G. Blincoe, of Bardstown, read a paper on "Ametropia and Heterophoria, with Remarks on Eye-Strain," which was discussed by Dr. Ray, Dr. Kelsey, and Dr. Blincoe.

Dr. Edward Speidel, of Louisville, presented a paper on "One Hundred and Thirty-two Gall-stones Removed Without Operation."

Dr. William H. Wathen, of Louisville, read a paper on "The Technique in Operations per Vaginam in Diseases of the Uterus and Surrounding Structures."

Dr. H. K. Adamson, of Maysville, read a paper on a "Case of Gunshot Wound of the Femoral Artery: Ligation. Recovery."

Dr. R. Alexander Bate, of Louisville, read a paper on "Suprarenal Extract in the Treatment of Addison's Disease," which was discussed by Dr. Frank C. Wilson, of Louisville, and Dr. Thomas H. Stucky, of Louisville.

Dr. Frank C. Wilson, of Louisville, read a paper on the "Etiology and Treatment of Pneumonia."

Dr. John G. Cecil, of Louisville, read a paper on the "Treatment of Lobar Pneumonia."

These two papers were discussed conjointly by Drs. George W. Beeler, F. J. Yager, Snyder, Stucky, W. W. Richmond, and by Dr. Wilson in closing.

On motion, the Society adjourned until Friday, 9:00 A. M.

Evening of second day a banquet was served at Fountain Ferry Park.

THIRD DAY—*Morning Session.*

The Society reassembled and was called to order by the President at 9:30 A. M.

The Secretary: The report of the Nominating Committee has been handed to me, which I will read:

Your Committee begs leave to make the following report. We have selected for

President—Dr. William Bailey, Louisville.
First Vice-President—Dr. James H. Letcher, Henderson.
Second Vice-President—Dr. R. Craig Falconer, Lexington.
Treasurer—Dr. Charles W. Aitkin, Flemingsburg.
Librarian—Dr. George Edwin Davis, Lawrenceburg.
Permanent Secretary—Dr. Steele Bailey, Stanford.
Chairman of the Committee of Arrangements—Dr. John A. Lewis, Georgetown.
Place of Meeting—Georgetown.

On motion, the Secretary was instructed to cast the ballot for the election of the officers proposed by the Committee on Nominations, and they were declared elected unanimously.

The proposed change in the Constitution was read by Dr. Tuley.

The President: This proposes to make some very radical changes in the Constitution, so I hope it will be discussed. It is now open for discussion.

Dr. Kelsey: Mr. President, I move you, sir, that the proposed amendment be laid on the table. The motion was seconded and carried.

Dr. Tuley: Mr. President, I move that the President-elect be escorted to the platform. The motion was seconded.

The Chairman: The ceremonies were to take place a little later, but if the gentlemen insist upon it they can take place now.

It was moved that a Committee be appointed by the Chairman to conduct the President-elect to the platform, whereupon the Chairman appointed Dr. Brown and Dr. Lewis, both of whom were ex-Presidents. Upon the newly-elected President reaching the platform, he was introduced by the Chairman, as follows:

Gentlemen of the Kentucky State Medical Society:

It gives me very great pleasure to introduce Dr. William Bailey, of Louisville, your President-elect.

Dr. Bailey responded as follows:

Mr. President and Gentlemen of the Society:

I should be untrue to myself were I to say that this is not a great pleasure. I assure you it is an honor that I fully and highly appreciate. Nothing in my life has given me more pleasure than this. I can honestly say to you that it is particularly appreciated on my part because it is gratuitous on yours. I can honestly say that I have mentioned this subject to no mortal man, hence it comes to me unsolicited absolutely, and is appreciated, therefore, the more fully. I wish I had words to express to you the feelings that are in my heart and the gratitude I feel toward you for this very generous consideration. I have no set speech to make. I simply wish to ask your indulgence, and particularly your assistance in the management of the Society for the coming year. I am sure, from the history of the Society, that I shall have this fully granted me. I want to say that I believe the profession in the State is better organized at the present time than it ever has been before in the history of our State affairs.

I want to say in this connection, too, in behalf of another relation that I bear to the profession, that we have appreciated the generous aid you have afforded the State Board of Health in their medical work in the State. I want to ask of you that this be continued. I believe that the endorsement and the support of the profession for that association is a necessity for our good. You have come to our help when we needed you, and I believe that if the profession of this State does not get what it needs, it is because you either do not demand it or do not ask for it. Consequently I beseech you, when the State Board's matters become serious and we ask you for help, that you grant it us as bountifully as you have heretofore. I believe we shall have a hard time in the next year or two. The indications are that there will be a fight which will be a serious one, and I ask you that you will see that your local profession is organized so as to support and maintain the dignity of the State. I am gratified at the success of this meeting of the Society. I can not hope to rival the administration that is now retired. All I can say is that whatever there is in me of ability, certainly I will give you a disposition to discharge my duties fully.

Thanking you, gentlemen, for this very honorable consideration, I am, yours. (Applause.)

Dr. J. L. Johnson, of Louisville, read a paper on "Hernia and its Operative Treatment."

Discussed by Dr. Greenley, Dr. Dugan, Dr. Maddox, and by the essayist in closing.

Dr. C. W. Aitkin, of Flemingsburg, presented a paper on "Some Cases of Country Surgery."

Discussed by Drs. Bullitt, Dugan, Bailey, Yager, Cherry, and by Dr. Aitkin in closing.

Dr. W. B. Doherty, of Louisville, read a paper on "New Arts in Practice."

Discussed by Dr. McCormack, Dr. Solomon, Dr. Early, and Dr. Doherty in closing.

Dr. John A. Lewis, of Georgetown, read a paper on "Traumatic Tetanus."

Discussed by Dr. Lecke, Dr. Early, Dr. Greenley, Dr. Yager, Dr. Dugan, Dr. McCormack, Dr. E. E. Hume, Dr. R. O. Pratt, and in closing by Dr. Lewis.

Dr. Basil M. Taylor, of Greensburg, read a paper on the "Practical Treatment of Typhoid Fever."

Discussed by Dr. Honeycutt, Dr. Gossett, Dr. Gaddy, Dr. Thornton, Dr. Bate, and by Dr. Taylor in closing.

On motion, the Society adjourned until 2:30 P. M.

THIRD DAY—*Afternoon Session.*

The Society was called to order at 2:30 P. M. by the President.

Dr. T. B. Greenley, of Meadow Lawn, read a paper on "The Vital and Mortuary Statistics of Kentucky."

Dr. J. T. Dunn, of Louisville, who was to open the discussion of a paper on "Some Practical Work with the X-Ray," the author of which was not present, requested permission to show some specimens of X-ray photography. The request was granted.

Dr. H. E. Tuley, of Louisville, read a paper on "The Materna: A New Device for Home Modification of Milk."

Dr. A. H. Kelch, of Louisville, read a paper on "Physical Examination for Life Insurance."

Dr. J. V. Prewitt, of West Point, read a paper entitled "Report of Seven Cases of Empyema, with Treatment."

The Chairman: Gentlemen, this completes the programme, and I wish now to report the following committees:

Committee on Publication—Thos. S. Bullock, Louisville, Chairman; Philip F. Barbour, Louisville, and Steele Bailey, Stanford.

Committee on Necrology—James H. Letcher, Henderson, Chairman, and T. Hunt Stucky, Louisville.

Committee on Topics for Discussion—A. Morgan Cartledge, Louisville, Chairman; John G. Cecil, Louisville; Ancil D. Price, Harrodsburg; R. D. Pratt, Shelbyville, and Charles H. Todd, Owensboro.

Board of Censors—Joseph B. Marvin, Louisville, Chairman; B. L. Coleman, Lexington; T. B. Greenley, Meadow Lawn; J. D. Maddox, Rockport; Basil M. Taylor, Greensburg, and Harvey McDowell, Cynthiana.

Committee on Public Policy—Dudley S. Reynolds, Louisville, Chairman, and J. N. McCormack, Bowling Green.

Dr. John A. Lewis, of Georgetown, offered the following resolutions, which were unanimously adopted:

The forty-fourth annual session of this Society has been one of the most successful the Society has ever held. The arrangements for conducting the work of the Society have been the best, and the hospitality extended the visiting members by the medical profession of the city of Louisville have been of that cordial and generous character for which this fair city is famous.

We desire to place on record our thanks for the services of Dr. John G. Cecil and his associates of the Committee of Arrangements. We proffer our thanks also to the members of the profession of the city of Louisville for their unbounded and elegant hospitality; to the press of the city for courtesies, and to the President, Dr. David Barrow, and the other officers for their efficient services.

Adjourned *sine die.*

ROSTER.

Adams, John F., Bagdad.
Adamson, H. K., Maysville.
Aitkin, C. W., Flemingsburg.
Albright, Gran. V., Barbourville.
Alcorn, Edward, Hustonville.
Allan, B. A., Louisville.
Anderson, Turner, Louisville.
Atkins, Henry S., Russell Cave.
Austin, Curtis, Bagdad.
Atkinson, J. L., Campbellsville.
Aud, C. Z., Cecilian.
Adamson, O. H., Sardis.
Adams, W. E., Stinnett, Anderson Co.
Allen, Thomas P., Elmo, Christian Co.
Anderson, C. M., Booneville, Owsley County.
Blincoe, A. G., Bardstown.
Bagby, D. M., Walton.
Bailey, Steele, Stanford.
Bailey, William, Louisville.
Banta, Will P., Louisville.
Barbour, Philip F., Louisville.
Barrow, David, Lexington.
Buntin, Hanson, Bramlette.
Beard, E. T., Todd's Point.
Beard, Frank M., Shelbyville.
Beard, W. F., Shelbyville.
Becket, J. R., Powersville.
Beeler, Geo. W., Clinton.
Bethel, John T., Poole's Mills.
Blaine, A. D., Dry Ridge.
Bloom, I. N., Louisville.
Blue, W. R., Louisville.
Bodine, J. M., Louisville.
Bogle, John C., Danville.
Bowen, D. C., Nolyn.
Boggess, W. F., Louisville.
Boyd, Frank, Paducah.
Brice, J. C. S., Flemingsburg.
Brooks, John G., Paducah.
Brown, Hawkins, Hustonville.
Brown, Joseph T., Clintonville.
Brown, W. A., Parksville.
Bryan, Joseph, Lexington.
Buchanan, James B., Campbellsville.
Buckner, W. T., Shelbyville.
Bullock, T. S., Louisville.
Butler, Thomas L., Louisville.
Butt, A. L., Franklin.
Barker, J. C., Hustonville.
Barnes, J. Robert, South Carrollton.
Barkley, A. H., Lexington.
Board, Milton, Hardinsburg.
Bosley, J. G., Union City.
Barnhill, J. W., Pleasant Ridge.
Bullitt, James B., Louisville.
Benton, John James, Barcelona, Union County.
Bernheim, Albert, Paducah.
Bate, R. Alexander, Louisville.
Bryan, F. F., Georgetown.
Brown, Isaac H., Winchester.
Browning, L. Y., Mayslick.
Baker, Thomas H., Louisville.
Brandeis, Florence, Louisville.
Botts, Samuel T., Etoile, Barren Co.
Boyd, R. L., Allensville, Todd Co.
Brown, J. Sam., Ghent, Carroll Co.
Botts, J. W., Owenton.
Barnett, Frank A., Lebanon Junction.
Caldwell, R. C., Shelbyville.
Carpenter, J. G., Stanford.
Carrick, J. C., Lexington.
Cartledge, A. M., Louisville.
Cecil, John G., Louisville.
Cheatham, William, Louisville.
Chenoweth, James S., Louisville.
Clarke, F. H., Lexington.
Coffman, W. H., Georgetown.

Coleman, B. L., Lexington.
Coleman, J. R., Murray.
Coleman, W. W., Mt. Washington.
Contri, Lewis G., Carmel.
Coombs, Samuel W., Bowling Green.
Coomes, Martin F., Louisville.
Cottell, H. A., Louisville.
Crowley, James W., Newport.
Carr, W. H., Claysville.
Conway, W. H., Sunset.
Cleaver, Thos. F., Lebanon.
Cooper, J. B. R., Springfield.
Cowan, Harry J., Danville.
Creel, M. P., Central City.
Crosby, J. A., Shelbyville.
Carlton, R. E., Bethany.
Croft, Geo. W., Louisville.
Caldwell, A. G., Ballard, Anderson County.
Coyle, D. A., Lexington.
Compton, Ben. F., Corydon, Henderson County.
Converse, T. Edwards, Louisville.
Cherry, E. A., Morgantown, Butler County.
Cassity, John C., Eminence.
Cain, Achilles W., Somerset.
Clark, J. Johnson, Marion, Crittenden County.
Dabney, S. G., Louisville.
Dalton, J. M., Harrodsburg.
Daugherty, Thos. H., Sadieville.
Davis, Geo. E., Lawrenceburg.
Demaree, Owen, Benson Depot.
Dixon, Archibald, Henderson.
Dixon, Archibald, Jr., Henderson.
Doherty, W. B., Louisville.
Duerson, W. B., Mt. Sterling.
Dugan, W. C., Louisville.
Dunlap, Fayette, Danville.
Dunn, M. C., Zion.
Davis, H. C., Harrodsburg.
Demaree, Joseph, S., Mackville.
Deboe, John, Texas.
Dunn, J. T., Louisville.
Durrett, L. P., Prestoria.
Daugherty, W. T., Hilltop.
Dailey, Wilson G., Jackson, Breathitt Co.
Dunlap, Thomas G., Louisville.
Drake, John W., Louisville.
Dickenson, J. S., Trenton, Todd Co.
Duff, John T. H., Louisville.
Evans, John B., Riley.
Evans, Thos. C., Louisville.
Early, J. Louis, Knottsville.
Eckman, B. F., Mt. Carmel.
Eads, D. D., Paris.
Earle, Ben. F., Charleston, Hopkins County.
Falconer, R. C., Lexington.
Fallis, Robert G., Louisville.
Ferguson, R. V., Guthrie.
Frank, Louis, Louisville.
Freeman, J. A., Beard.
Frey, R. Wesley, Trenton.
Feland, John M., Reynoldsville.
Forsythe, M. L., Harrodsburg.
Fithian, Frank, Paris.
Fitch, J. W., Russell.
Finley, Thomas R., St. Charles, Hopkins County.
Foster, William E., Owenton.
Ferguson, John P., Louisville.
Gibson, H. R., Richmond.
Garner, W. F., Humphrey.
Garr, C. R., Flemingsburg.
Gilbert, R. B., Louisville.
Grant, W. E., Louisville.
Grant, H. H., Louisville.
Grant, James M., Petersburg.
Gates, Hugh W., Calhoun.
Greenley, T. B., Meadow Lawn.
Griffith, P. F., Henderson.
Groves, C. I., Louisville.
Guest, J. W., Louisville.
Guthrie, W. A., Franklin.
Griffiths, D. M., Owensboro.
Gilmore, W. S., Sorgho, Daviess Co.
Graham, C. B., Henderson.
Gossett, Walker B., Louisville.
Grissom, William R., Columbia.
Glass, A. M., Booneville.
Gilbert, Jonas S., Van Buren, Anderson County.

Garr, B. A., Louisville.
Gaddis, David M., Hodgenville.
Gilmer, John P., Louisville.
Goslee, Levin E., Lakeland.
Gibson, William M., Richmond.
Hanna, W. M., Henderson.
Harwood, Chas. P., Shelbyville.
Hays, John Edwin, Louisville.
Helm, S. L., Spears.
Henderson, Peyton R., Louisville.
Herndon, B. F., Barbourville.
Herring, H. C., Lancaster.
Hertsch, Della, Louisville.
Heuser, Henry, Louisville.
Hobson, Willis W., Harrod's Creek.
Hodge, J. A., Henderson.
Holloway, J. W., Keene.
Holloway, U. G., Troy.
Holmes, B. L., Carrollton.
Hopson, Joseph, St. Matthews.
Horine, G. Z., Graefenburg.
Huddleston, J. W., Murphysville.
Hume, E. E., Frankfort.
Humphrey, J. A., Wilson.
Heavrin, J. P., Owensboro.
Heavrin, C. M., Owensboro.
Hoover, J. C., Owensboro.
Harris, S. J., Philpot.
Hamilton, J. D., Louisville.
Hibbitt, C. W., Louisville.
Haynes, W. L., Calhoun.
Hancock, D. O., Henderson.
Hiflin W. R., Lakeland.
Hood, W. H., Orangeburg, Mason Co.
Huzer, W. J., New Haven.
Hayden, John V., Salem, Livingston County.
Holley, Samuel W., Payne's Depot.
Handley, V. E., Sturgis, Union Co.
Honeycutt, James B., Temple Hill, Barren County.
Howell, J. D., Vine Grove, Hardin County.
Ingram, Julia, Louisville.
Irwin, J. W., Louisville.
Insco, Mark, Brattan.
Ishmael, R. B. L., Winchester.
Ishmael, J. W., Winchester.
Jackson, A. W., Earlington.
Jemison, W. E., Eminence.
Jenkins, J. O., Newport.
Johnson, Calvin R., Eminence.
Johnson, J. E., Lebanon Junction.
Johnson, Campbell H., Henderson.
Jones, A. N., Walton, Boone Co.
Jones, R. M., Louisville.
Johnson, James L., Louisville.
Kelly, Edward, Lebanon.
Kash, Oliver S., Moorefield.
Kavanough, C. W., Lawrenceburg.
Keen, W. C., Burksville.
Kennedy, O. A., Louisville.
Kenyon, F. P., Middlesborough.
Kincaid, J. W., Catlettsburg.
Kinchloe, A. M., Hardinsburg.
Kinnaird, James B., Lancaster.
Kinnaird, T. H., Lexington.
Knox, D. B., Georgetown.
Kelch, Allen H., Louisville.
Lassing, H. C., Union.
Lawrence, Annie F., Louisville.
Leathers, Chas. A., Lawrenceburg.
Lee, J. R., Columbus.
Letcher, James H., Henderson.
Lewis, C. C., Owensboro.
Lewis, John A., Georgetown.
Lewis, John C., Georgetown.
Lillard, G. D., Lawrenceburg.
Lockheart, C. J., Owensboro.
Long, John L., Frankfort.
Lowry, John C, Troy.
Luckett, E. H., Owensboro.
Lapsley, F. Lee., Paris.
Lapsley, J. P., McAfee.
Lambert, Stinson, Owensboro.
Long, Lewis H., North Fork.
LaRue, Fred G., Hampton, Livingston County.
Maddox, J. D., Rockport.
Mann, Charles M., Nicholasville.
Mansfield, Cassius D., Lexington.
Marshall, Ewing, Louisville.
Martin, W. M., Kingston.
Marvin, J. B., Louisville.

Mathews, J. M., Louisville.
McChord, R. C., Lebanon.
McClure, W. B., Lexington.
McCormack, Jos. N., Bowling Green.
McCormack, A. T., Bowling Green.
McCormick, Emmett B., Owensboro.
McDowell, Harvey, Cynthiana.
McDowell, James L., Central City.
McDowell, Lucien, Flemingsburg.
McMurtry, Lewis S., Louisville.
McNue, Nelson H., Carlisle.
McLean, Hugh L., Wilmore.
McKinney, A., Whitesville.
McLain, J. H., Curdsville.
Meek, J. M., Morgan.
Meek, Harrison D., Claysville.
Meredith, Thos. O., Burgin.
Morris, Wm. E., Southville.
Mathews, W. H., Nicholasville.
Morrison, A. M., Goshen.
Moss, Virgil U., Rockfield.
Monaugh, T. L., Vanarsdall.
Mounsey, Geo. T., Louisville,
Moorman, H. A., Sacramento.
Monroe, Geo. J., Louisville.
Miller, J. A. H., Princeton.
Mattingley, Wm. E., Lebanon.
Miller, Wm. P., Cleopatra.
Moore, J. S., New Hope.
Morris, J. M., Louisville.
Meany, W. B., Louisville.
Mitchell, John L., Beaver Dam.
Miller, F. A., Owensboro.
Manley, Clarence J., Louisville.
Moreman, A., Yelvington.
Martin, J. Gray, Carlisle.
Moore, Geo. W., Ashland.
Moir, Charles, Louisville.
McBee, H. S., Jonesville, Owen Co.
Moreman, L. B., Irvington, Breckinridge County.
Mosely, John C., Henderson.
Minish, Lawrence F., Harvieland, Franklin County.
McIntyre, Chas. W., Louisville.
Nelson, W. C., Salvisa.
Norment, Henry T., Anthoston.
Nutall, Wm. L., New Castle.
Norris, Chas. W., Lexington.
Nunn, Wm. H., Henshaw, Union Co.
Nelson, John Allen, Owensboro.
Nusz, Heubert R., Central City.
O'Connor, John W., Elizabethtown.
O'Bannon, James B., Mt. Carmel.
O'Bannon, Wm. B., Stanford.
Oldham, John Y., Lexington.
Oldham, Ira B., Speedwell.
Ouchterlony, John A., Louisville.
Parker, J. H., Corbin.
Parker, J. W. F., Somerset.
Patterson, Thos. L., Lexington.
Pelle, H. E., Louisville.
Perrin, J., Simpsonville.
Pitman, H. L., East Bernstadt.
Plummer, H., Harrodsburg.
Pope, Curran, Louisville.
Pound, T. P. D., Wilsonville.
Powell, Hugh B., Corydon.
Powell, J. N., Corydon.
Powell, W. D., Harrodsburg.
Powers, J. G., Fairfield.
Poyntz, J. M., Richmond.
Poyntz, C. Edwin, Paint Lick.
Pratt, R. D., Shelbyville.
Prewitt, James V., West Point.
Prewitt, Nelson V., Winchester.
Price, Ancil D., Harrodsburg.
Price, Joseph L., Sherman.
Pusey, H. M., Louisville.
Peyton, J. F., Stanford.
Price, J. Tom, Burgin.
Payntor, C. M., Lawrenceburg.
Pusey, W. B., Louisville.
Prichard, J. Milton, Yale.
Pangburn, Samuel, Maysville.
Pfingst, Adolph O., Louisville.
Peyton, David C., Louisville.
Parrish, Ben F., Midway.
Pipes, M. Lee, Moreland, Lincoln County.
Pruett, Geo. W., Mannsville.
Ramsey, R. T., London.
Ray, J. M., Louisville.
Ray, W. R., Chestnut Grove.

Reddick, James T., Paducah.
Reddish, Geo. M., Somerset.
Reynolds, Dudley S., Louisville.
Richmond, W. W., Clinton.
Riley, F. F., Anchorage.
Roberts, H. H., Paris.
Roberts, W. O., Louisville.
Robertson, A. S., Sherburne.
Robertson, J. D., Paducah.
Rodman, W. E., Hodgenville.
Ray, W. W., Springfield.
Rinehart, James T., Springfield.
Reynolds, Ben. F., Carlisle.
Robinson, J. M., Guthrie.
Roy, J. C. B., Rome.
Royster, L. C., Henderson.
Russell, J. D., Yelvington.
Rees, J. M., Cynthiana.
Robertson, L. L., Middlesborough.
Rodman, J. D., Owensboro.
Ringo, James M., Louisville.
Samuel, F. W., Louisville.
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Scott, Preston B., Louisville.
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Stone, J. E., Herndon, Christian Co.
Snyder, J. H., Mt. Eden, Spencer Co.
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Wells, James F., Brandenburg.
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Weil, S. D., Rumsey.
Wedding, Sylvester J., Sulphur Spring.
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Yager, C., North Pleasureville.
Young, Frank O., Lexington.
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